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OIL WORLD
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MODERN OPERATORS INSIST UPON

SECURITY

THERE IS no longer any need to use one tool for reaming and another for stabilizing. You can ***successfully*** and ***safely*** ream and stabilize ***with one device, at the same time,*** at a ***cost far lower*** than by any other method.

With a SIEVERS REAMER you not only secure ***efficient stabilization*** and ream a ***round, full-gauge*** hole, but the amazing fact is that ***drilling speed actually is increased*** in the majority of installations.

Let us refer you to enthusiastic users in your territory—or if you want details and specifications, look on Pages 1538 and 1539 of the 1937 Composite Catalog.

SIEVERS REAMERS

. . . contain cutters (with sharp, disc-like teeth) which are set at an angle to lead into the formation with a slicing, shearing action. The reaming action thus secured is far more effective than when cutters are set at the reverse angle, and naturally is beyond comparison with conventional roller-type reamers which must depend upon a swedging, knurling action for reaming results.

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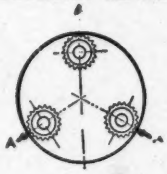

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SIEVERS REAMER

SECURITY SLUSH PUMP VALVES

The destructive impacts of valve o seat, and the abrasive wear on th sealing surface of the seat, are elimin ated by the modern design of SECUR ITY VALVES.

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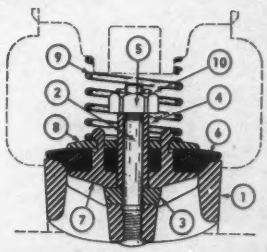

Details of how wear is avoided an low-cost operation is made possible are given in the 1937 Composite Cata log, on Page 1540, and in the new SECURITY CATALOG sent upon request.

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SECURITY

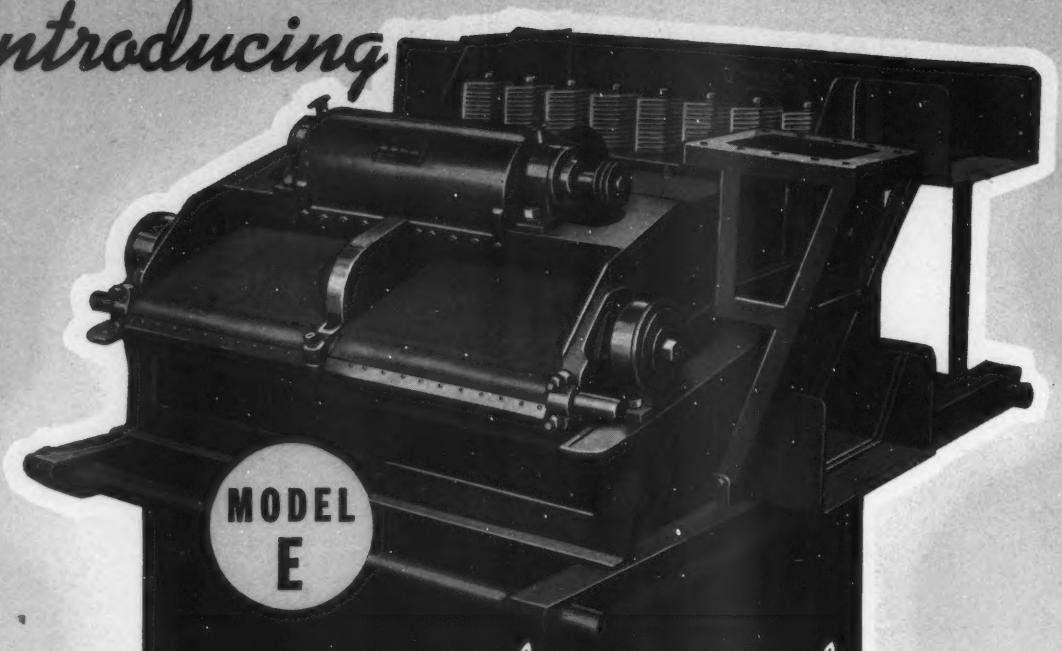
VALVES • DRILLABLE LINERS
AND SIEVERS REAMERS

MAY 20, 1937

Vol. 39
No. 10

Whole
No. 1489

Introducing



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Be sure to see and learn about the new and improved McNEELY Vibrating Mud Screen. It's in step with the times—it's a vital factor in assuring faster, more economical drilling.

Ask for *your* copy of Bulletin No. 101 which illustrates and describes the new McNEELY Vibrating Mud Screen.

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CALIFORNIA
OIL WORLD
and Petroleum Industry

THE WORLD'S OLDEST OIL TRADE PUBLICATION

MAY 20, 1937
VOL. 30 • NO. 10
WHOLE NO. 1489

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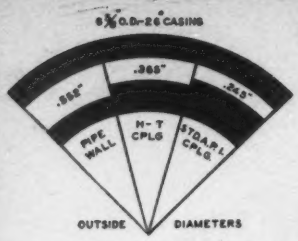
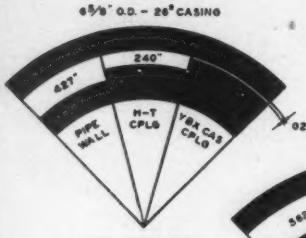


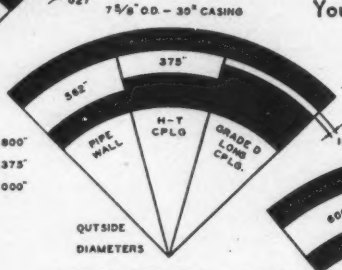
OUTSIDE DIAMETERS

STANDARD A.P.I. COUPLING	8.364"
YOUNGSTOWN H-T COUPLING	8.125"
PIPE OR FLUSH JOINT	4.750"



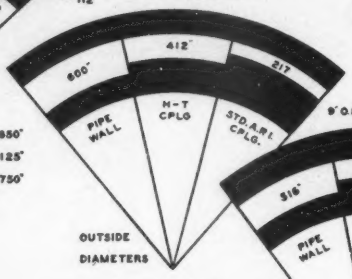
OUTSIDE DIAMETERS

YBX CASING COUPLING	5.800"
YOUNGSTOWN H-T COUPLING	5.375"
PIPE OR FLUSH JOINT	5.000"



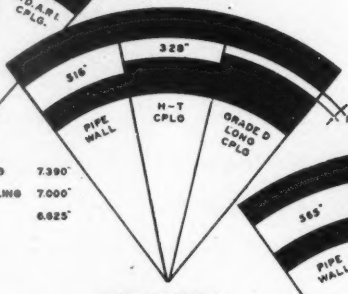
OUTSIDE DIAMETERS

GRADE D LONG COUPLING	6.850"
YOUNGSTOWN H-T COUPLING	6.125"
PIPE OR FLUSH JOINT	5.750"



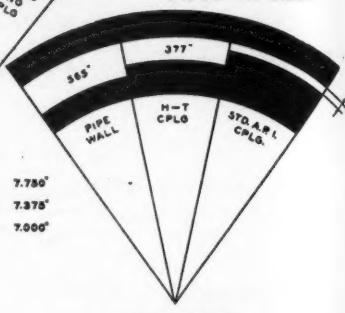
OUTSIDE DIAMETERS

STANDARD A.P.I. COUPLING	7.390"
YOUNGSTOWN H-T COUPLING	7.000"
PIPE OR FLUSH JOINT	6.625"



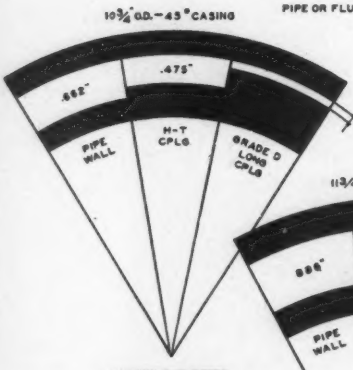
OUTSIDE DIAMETERS

GRADE D LONG COUPLING	7.750"
YOUNGSTOWN H-T COUPLING	7.375"
PIPE OR FLUSH JOINT	7.000"



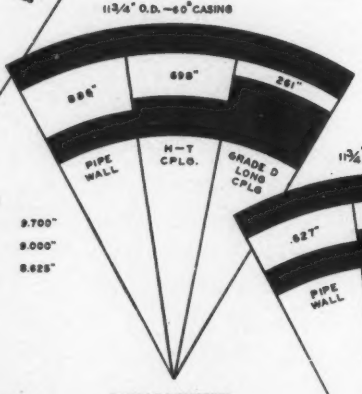
OUTSIDE DIAMETERS

STANDARD A.P.I. COUPLING	8.500"
YOUNGSTOWN H-T COUPLING	8.000"
PIPE OR FLUSH JOINT	7.625"



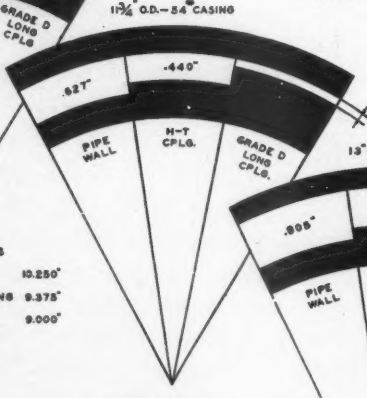
OUTSIDE DIAMETERS

GRADE D LONG COUPLING	9.700"
YOUNGSTOWN H-T COUPLING	9.000"
PIPE OR FLUSH JOINT	8.625"



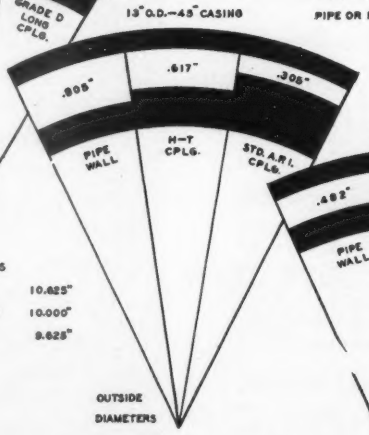
OUTSIDE DIAMETERS

GRADE D LONG COUPLING	10.250"
YOUNGSTOWN H-T COUPLING	9.375"
PIPE OR FLUSH JOINT	9.000"



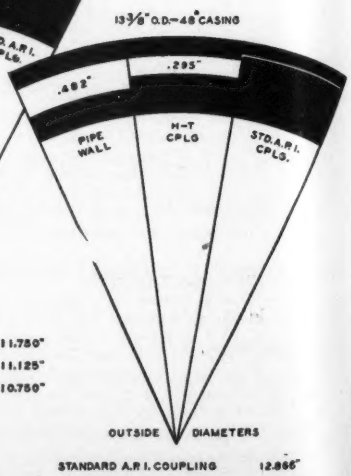
OUTSIDE DIAMETERS

GRADE D LONG COUPLING	10.625"
YOUNGSTOWN H-T COUPLING	10.000"
PIPE OR FLUSH JOINT	9.625"



OUTSIDE DIAMETERS

STANDARD A.P.I. COUPLING	11.750"
YOUNGSTOWN H-T COUPLING	11.125"
PIPE OR FLUSH JOINT	10.750"



OUTSIDE DIAMETERS

STANDARD A.P.I. COUPLING	12.866"
YOUNGSTOWN H-T COUPLING	12.125"
PIPE OR FLUSH JOINT	11.750"

Clearance diagrams on this page approximately 2-5 actual size

OIL COUNTRY TUBULAR GOODS

TRADE MARK

YOUNGSTOWN

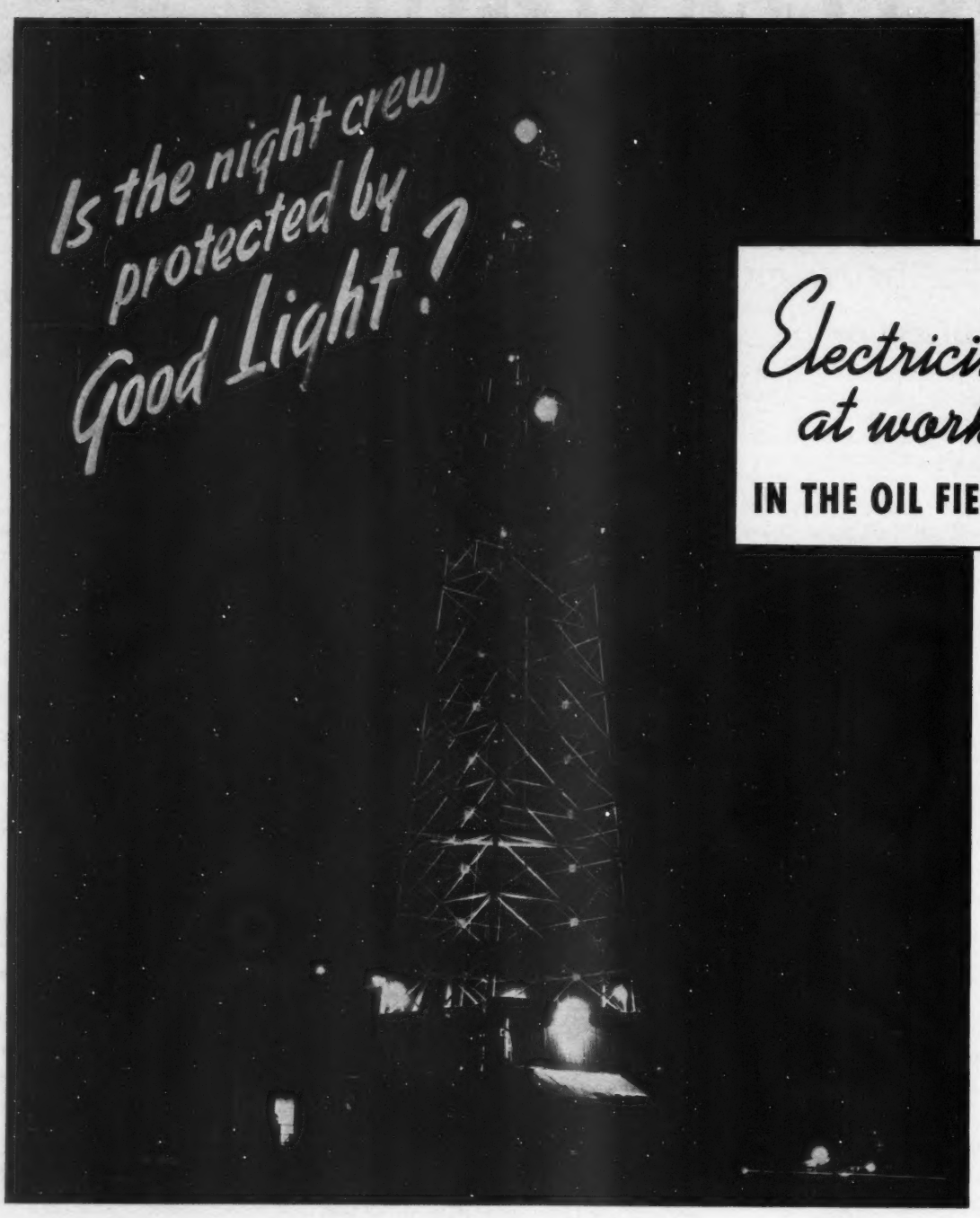
CALIFORNIA
OIL WORLD
and Petroleum Industry

A Labor Conference

Even though the tide of sitdown strikes has lately ebbed, and even though the oil industry escaped the flood, probably because it is thus far not very completely organized, and has had a history of amicable labor relations, nevertheless, the matter of personnel relations is assuming more and more prominence. Due to its peculiar characteristics, the oil industry is hard to organize. The history of labor movements shows that several factors must be present in order for successful organization of labor to be possible. Among the factors are close association of workers in a confined area; discontent; and maladjustment of relations between labor and management. The oil industry presents obstacles on all these counts. The workers in the oilfields are not closely associated in a confined area, they are in general not discontented, and most all of the major operators, together with a number of others, have made definite and concrete attempts to meet the workers more than half way.

There are one or two weak spots in the structure, however, and these weak spots may be so manipulated by labor organizers, when they make a determined attempt to enter the oil industry, that they will affect the labor of the whole industry. The weak spots are tank truck drivers, service station operators, and refinery workers. It behooves the industry to take steps to engender as cordial relationships with these groups, particularly service station operators and tank truck drivers, as have already been engendered with the operating personnel in the fields.

In light of the fact that organization of labor has already been started, and in view of the recent decision on the Wagner law, together with the obvious need for recognition of the fact that, like it or not, we are in a time of fundamental change insofar as management's relationships with labor are concerned, it is a matter for sound satisfaction that a group of the local oil industry, for the first time in local business history, is bringing the whole question to the fore by holding a conference with the regional director of the National Labor Relations Board, so that the industry may know what the governments' attitude can be expected to be when labor questions arise.



Electricity at work

IN THE OIL FIELDS

A poorly lighted derrick . . . a night crew working under pressure . . . there you have a perfect setting for a serious accident. Good lighting is safety insurance that pays dividends in protection to men and property. It speeds up production and reduces errors. How does your rig compare with accepted lighting standards?

	Foot Candles on the Average Rig	Good Lighting on New Rigs
Driller position	½ foot candle	5 foot candles
Pipe racker	¼ foot candle	4½ foot candles
Lead Tongs	¼ foot candle	4½ foot candles
Cat Head	½ foot candle	4 foot candles
Standard Engine	2½ foot candles	8 foot candles
Pump House	3 foot candles	8½ foot candles

Complete details gladly furnished.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

SHELL COMPANY OF CALIFORNIA

By Douglas G. McPhee

Chapter II—Evolution, 1913-1922

As the Southern Pacific train pulled away into the distance a lone man, hands clasped behind him, stood beside the station gazing up at a dusty white sign. He read, "Martinez—Elevation 10 feet—San Francisco 35 miles". To himself the man muttered: "More to the point if that sign told how many miles it is to Coalinga".

The man was J. C. van Eck. Perhaps the picture is imaginary, but it is easy to see him standing thus, on a warm summer day in 1914, as he prepared to write the word Shell in tall red letters across a page in California's oil history, and took his first look at Martinez, the scene of an important step in this program of development. Van Eck moved briskly off down the deep-rutted dirt road toward the sleepy town. To him it must have seemed a strange and picturesque place, with its dust-covered Main Street white in the August sunlight, its odd wooden sidewalks and its general air of resolute lassitude. We can imagine that van Eck's thoughts turned to his home in Holland halfway around the world. Perhaps he also thought of the port of Pankelan Brandon and the modern refinery that had raised its head incongruously above another sleepy town. As he looked out over San Francisco Bay sparkling in the sunshine doubtless he was reminded of Marcus Samuel, of the shells that had been gathered on a beach near London and had become the symbol of a vast organization world-wide in scope.

Years before, Henri Deterding, always on the lookout for bright young men, had set van Eck's feet in the path of eminence. Through the training-years Deterding had kept an eye on his protege and when, in 1912, the international oil man decided unobtrusively to enter the competitive American market, he selected J. C. van Eck as his principal representative in the United States.

The Man van Eck

Upon his arrival in San Francisco van Eck took over the reins of the American Gasoline Company, Shell's small sales subsidiary. Possessed of an unusually keen intelligence, van Eck soon learned the hows and whys of oil as produced and marketed in the Pacific West.

Mitchum, Tully and Company, California investment dealers, co-operating with the California Oil World, are making possible this series of articles telling of the origin, growth, and development of the companies making up the California oil industry of today. Mitchum, Tully and Company and the California Oil World are gratified that the readers of the publication are finding the articles of considerable interest as well as of historical value.

He was thorough and conscientious, and it was not long before fellow oil men recognized that this pleasant young Californian-by-adoption was something more—a good deal more—than average. Those men who had dealings with him found him direct and dependable. They liked his human qualities, his straightforwardness and his complete lack of pretension and pretense. They usually came away feeling that they had talked with a man, who, confronted with a problem, went straight to its heart.

Van Eck liked his American job and he tackled it with all the vigor that his Dutch ancestors had given him. He liked California and its people and they, responding, liked him. He had learned, firsthand, American production and sales methods and he was ready to lead his newly formed company, Shell of California, into the complexities of American competition. When Shell, with both feet planted firmly on solid ground through the purchase of California Oilfields, Limited, actively entered the American drama, it was van Eck who played the leading role, who changed the plot, shifted the scenes and brought the whole Shell of California enterprise to a satisfying and thoroughly American climax in 1922—to which we shall come in due course.

Shell Buys a Site

Van Eck was in Martinez that August day to see for himself the proposed site for the construction of a large Shell refinery. He recognized the importance of the move, marking one of the final steps in the plans of Shell of California for aggressively entering all branches of the industry. Van Eck already knew that the 400 acres his company required for a refinery and tank farm were available at a reasonable figure; his associates had seen the land and had approved. He noted the natural harbor of Suisun Bay, the easy accessibility to ocean transportation, the proximity of the railroad. Inquiry revealed that there were 2000 inhabitants in Martinez and that its single industry, the Mountain Copper Company, supported but 150 families. The remainder of the population was dependent upon the farmers and orchardists of the adjacent valleys of Contra Costa County and the commerce brought to the port by passing river boats.

J. C. van Eck, who played the leading role in the Shell Company of California's successful invasion of the American oil market.

Oilfields, California, Shell's model oil town as it looked in 1919. In the background are a few of the company's 300 wells.

Van Eck liked the town and what it offered. That afternoon he returned to San Francisco. With three of his associates, Gallagher, Harris and Meischke-Smith, van Eck discussed the site and all the things involved in the building of a great refinery. Together they agreed that Martinez was the place, and a short time later a deal for the property was quietly consummated. Within two years, Shell's five-million-dollar refinery was ready, and Martinez had doubled in size.

Pre-War Shell

When, in 1913, Shell took over the properties of California Oilfields, Ltd., it acquired more than the 7200 acres of proven oil land in the dry and dusty San Joaquin. For its $14,000,000 Shell received the facilities to enter the booming American petroleum industry as a going concern—and a foundation on which to build future success. In the past decade the oil industry had been undergoing a great change. Oil men suddenly awoke to find that gasoline was no longer a bothersome by-product, but the key to the future of their industry. They knew at last that the automobile was no mere novelty, but the basis for a new kind of American civilization. America, as the automobile center of the world, became likewise the petroleum center of the world. All this Shell had considered and its entrance on the scene was admirably timed.

But the company that Shell purchased in 1913 was important only in the field of production. It was up to van Eck and his associates to carve out a new place for Shell and its products. Standard and Associated, long the principal customers of the California Oilfields, Ltd., were now to be its competitors. American Gasoline Company had been building a skeleton sales structure but there was much yet to be done. There was a transportation system to build; refineries to construct; a complete sales and marketing course to chart. Recognizing the magnitude of the task ahead, the autonomous young California company laid its plans with characteristic thoroughness.

While Shell of California was planning and building its refineries and pipe lines and developing its marketing system, the company proceeded to strengthen its producing position. Before the end of 1913 it had acquired the valuable properties of the W. K. and Turner oil companies. Between them, these companies owned approximately 655 acres of proven oil land in the East Side Coalinga Field which Shell purchased for $5,000,000 in cash and stock, an equivalent of $7500 an acre.

Shell Reaches Out

As the company entered 1914 its marketing plans, while nearing completion, were not yet ready for public announcement. The sales organization continued to be known as the American Gasoline Company. A reporter of that day joined with the entire oil industry in speculating on Shell's future plans.

"The American Gasoline Company, purveyors of Shell motor spirit to his Imperial Majesty, the California Autoist, has moved its headquarters from 1101 Kohl Bldg. to the Security Bldg., 343 Sansome Street. The yellow wagons with a pictured sea-shell on the side are a familiar sight all around the Bay. Very little news has come from the American headquarters of late. It is presumed they are too busily engaged attending to business to give out much information."

That reporter, for all his generalizing, had insight; large enterprises were afoot at 343 Sansome!

A glance at the record of the Shell Oil Company of California at the

Thousands of visitors to the San Francisco World's Fair met Shell of California for the first time in 1915. *This neat and efficient service station, strategically located just outside the Exposition's main entrance typifies Shell's aggressive program of advertising and marketing.*

close of 1914 reveals just how far it had come in the 18 months since the purchase of the Limited. Its 118 producing wells yielded more than 4½ million barrels of petroleum for the year. A tank farm on the Coalinga property with a total storage capacity of more than two million barrels was partially completed. Work had begun on the 170-mile line from Coalinga to Martinez. The Valley Pipe Line Company, a subsidiary, had been formed to take over construction of the San Joaquin pipe line system. A few months before the end of the year, the company had purchased the refinery site at Martinez, and plans were being laid for the construction of a 20,000-bbl. refinery. A 2000-bbl. refinery at Coalinga had already been started. For storage facilities at Martinez the company had ordered twenty 55,000-barrel reservoirs of the latest design.

Meanwhile, the marketing program had begun to take shape. The name had been officially changed from American Gasoline Co. to Shell Company of California, Inc. Representatives of the company now offered dealers in northern California, Oregon, Washington and Nevada a full Shell line—gasoline, lubricating oils and greases. The company had established 25 bulk plants to service Shell dealers and customers.

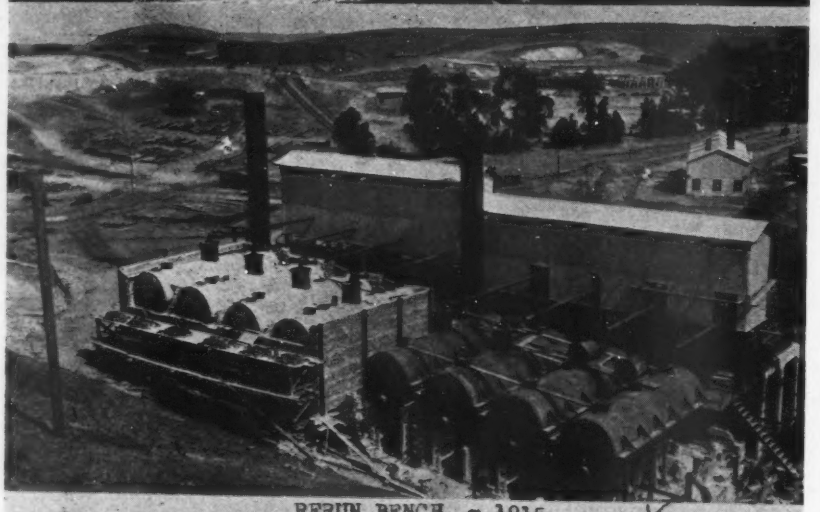
The Refinery Rises

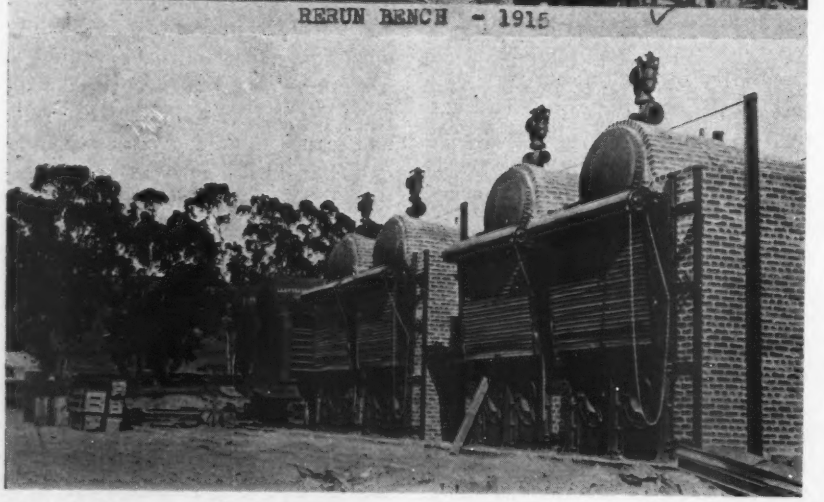
By the end of 1914 Shell engineers and surveyors began to arrive in Martinez. Never before in its history had this little community seen such activity. Trainloads of men, equipment, horses and mules arrived daily. Townspeople and country folk for miles around were employed at good wages. Hotels, restaurants and boarding houses were crowded. New barber shops, food stores and clothing establishments opened up on Main and Ferry streets to accommodate the influx of population.

The property over which van Eck had strolled in August was hilly open country. The roads leading to it were at that season covered with two feet of dust; now this dust had turned to mud. Work was difficult but Shell, then as today, selected its men with care. Grading was the first job the engineers tackled (they worked without the huge bulldozers and steamshovels that are today taken for granted). Manpower was all-important, and a few months after construction started Shell's Martinez payroll numbered 2000 men. Because the company adopted a policy of hiring and buying locally, long before its refinery was completed it had become an integral part of the community. Members of the organization entered into

the life of the town, joined its lodges, supported its chamber of commerce and participated in its civic enterprises.

When construction was completed, Shell selected hundreds of the men who had been on its payroll for two years of building and undertook to train them in oil refining. The wisdom of this move was soon manifest; the men were grateful and eager to learn. They knew the company's executives and policies; they knew that they would get a square deal. They learned fast. Within a few months, through able and patient guidance, experienced Shell men transformed a good construction crew into one of the best refining departments in the entire state.





Top: The original boiler house installation of the giant Shell refinery, as it looked at the end of 1915. Center: At the base of one of Martinez's rolling hills stood the original rerun bench of the Shell refinery in 1915. Bottom: The Shell refinery at Martinez was nearing completion in 1915. In this view are seen the Trumble plants and the Receiving House.

January 15, 1916, is a red-letter day in the history of Martinez and of Shell. At exactly 10:45 that morning the first barrel of crude flowed into the new refinery. A former member of the engineering staff that built the refinery, now an important Shell executive, describes the events of that day vividly.

"I get a lot of pleasure," he says, "out of recalling the early days at Martinez, particularly that opening day. I'd been working on the construction gang for two years and I figured that when the job was completed I would have to move on. I didn't like the prospects, for I admired the company and I knew from the way they had constructed that refinery that they meant business.

"One Sunday night just after New Year's a group of us were returning from San Francisco on the theatre train; the Southern Pacific used to put on ten extra cars every Sunday night to bring back the Shell crowd that had spent the week-end in the city. I was with my chief, a regular Shell engineer who had come from the California Oilfields, Ltd. We were talking about the opening of the refinery. Suddenly he said to me, 'John, would you like to learn the oil business?' When I unhesitatingly answered 'Yes', he continued, 'All right, instead of your job being over on the fifteenth, it's just going to begin'. That was my introduction to the oil business.

"Oil was new to me. I was interested, but like any greenhorn, pretty nervous about my new job. When you consider all that, it's not so surprising that every detail of my first

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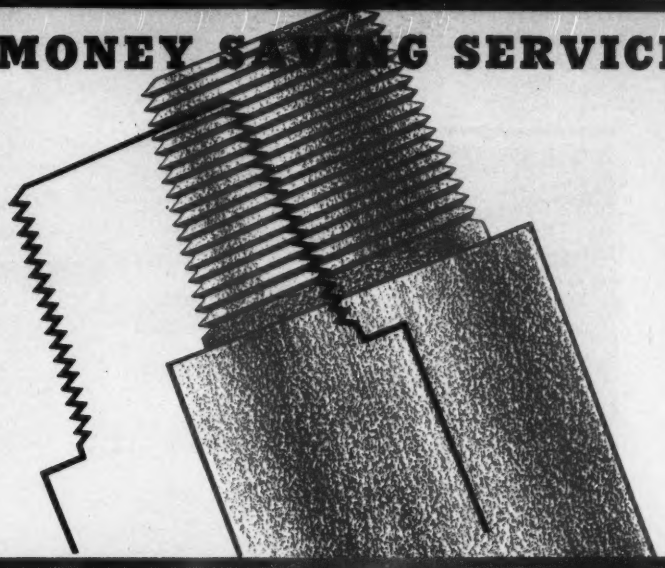

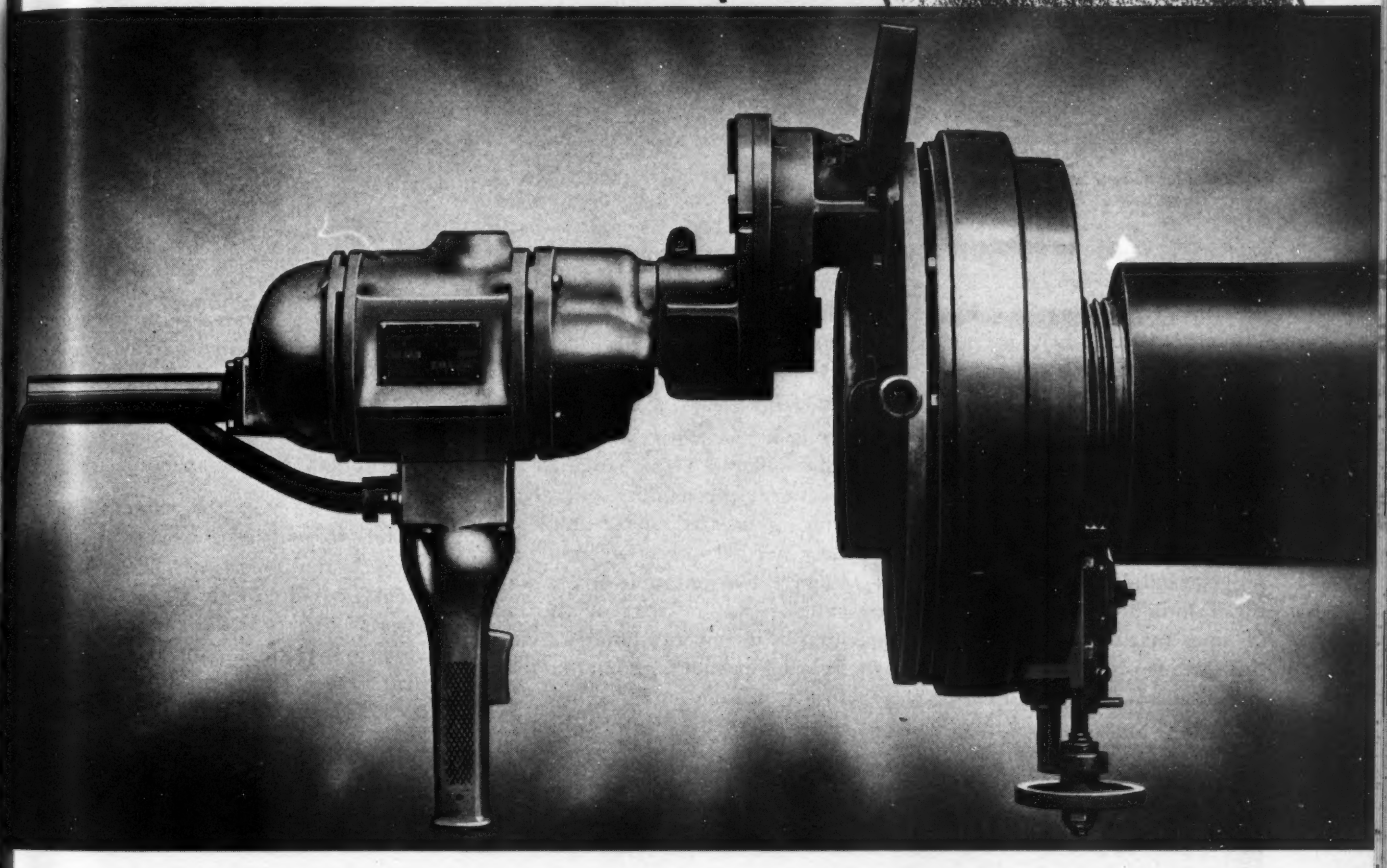

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THE JOHNSTON TOOL JOINT REFACER

In 1913, the young Shell Company of California was proud of its horses and fine road equipment. Tank wagons like the one pictured here were a familiar sight to the inhabitants of the San Francisco Bay region.

real day in the oil business stands out clearly in memory. First, I'll describe the refinery as it looked in January, 1916; then I'll tell you about that first day.

"As you walked over the hill from town the first thing that came into view was the Shell tank farm—175 tanks capable of holding 3,000,000 barrels of oil! Just west of the big tanks was the central refinery. The biggest building in the group was the Trumble plant with its network of pipes that carried the oil through the various processes of refining. Inside was the newest and best equipment that money could buy; super-heaters, dephlegmators and condensors. That plant was designed for efficient operation; within a month after it opened it handled 20,000 barrels of crude oil in one day.

"Next to the Trumble plant was the boiler-house with its eight water-tube boilers. These supplied all the steam for the refinery and, although they generated 2000 horsepower, they needed only two men to tend them. The pumping plant was located right in front of the boiler-house; its twenty pumps sent the finished products from the refinery to the storage tanks. A little to the north were two water-cooling towers and beyond those were the 4000-barrel kerosene agitators and the bleaching-house for the manufacture of lubricants. In addition to these there were the machine shops, forges, storehouse and offices, all new, all completely equipped.

Before the days of streamlined cars, Shell salesmen travelled California's dusty roads in cars like this.

"The folks that came from San Francisco, Oakland and the surrounding towns for the informal opening celebration were duly impressed. Those who had been familiar with the countryside before remembered only barren hills; now they saw a huge manufacturing plant with a dozen or so buildings and towers, nearly 200 tanks, four miles of macadam roads and a forty-mile maze of pipe line.

"After the first oil was run and we'd proudly shown our visitors the plant and the shiny new equipment, we walked them to the end of the 3300-foot wharf that ran from the refinery to tidewater. On the way we pointed out the narrow-gauge railway the company operated and the seven pipe-lines that enabled ocean-going vessels to load at the rate of 5000 barrels an hour.

"We fellows from the refinery were proud, for most of us had had a hand in building it. There were plenty of big oil men among the guests and the things they said about our company and our refinery made every one of us pleased with his company, himself and his job."

Forward with the Coast

That is an authorized, eye-witness picture of the great Shell refinery at Martinez. The opening of that plant marked the real beginning of modern Shell in California. From that time on the company refined all of its own products; its pipe line carried Shell-produced Coalinga oil direct from field to refinery; the sales and marketing end of the business leaped forward to keep pace with the ever-mounting production.

By 1917 its 232 wells produced more than 6 million barrels. The geological and development departments, after persistent efforts in the discouraging Ventura field, finally

brought in the discovery well and added a new proven area to Shell's already valuable holdings. Company-owned service stations and accredited outlets sold an increasing volume of Shell products to the motorists of Northern California, Oregon, Washington and British Columbia. Sales of Shell gasoline for 1917 neared the 10,000,000-gallon mark. The company had bulk plants and sales offices in the 36 most important communities in its territory. Marine installations were set up at San Francisco, Martinez, Portland, Seattle and Vancouver.

The Shell symbol was a familiar sight to the hundreds of thousands of Western motorists and mariners of 1917. The company that had quietly entered the American market four years before had achieved a stellar role in record-breaking time. Oil men wondered no longer what Shell was going to be or what Shell was going to do. The answer was there before them; Shell of California was a big, solid, substantial company, competing actively, aggressively and successfully with the West's major oil companies.

Once launched, Shell continued to expand steadily. By 1920 it controlled nearly 10,000 acres of oil lands; petroleum poured from 300 wells to its vastly enlarged refineries. That year the company sold over 25 million gallons of gasoline and paid almost a million dollars in taxes. Close to a hundred company stations served Shell customers along the highways of California, Oregon and Washington, and the Shell trade-mark was a familiar sight on the Pacific Coast, in Alaska, the Hawaiian Islands and the countries of Central and South America. The following year, 1921, its production department brought in the discovery well of the Long Beach field and the company moved into the really top-flight standing among big California producers.

National Alliance

Shortly after Shell appeared on the American scene through its purchase of the California Oilfields, Ltd., the great Shell Group took an important step in another part of the United States. It formed a subsidiary company, Roxana Petroleum Company of Oklahoma, for producing and refining operations in the Mid-Continent field. Sales headquarters were established in St. Louis and a refinery was built at Wood River, Illinois. The newcomer built solidly and by 1921 it had become a major factor in the production, refining, transporting and marketing of oil in the South and Middle West. It owned a pipeline from Tulsa, Oklahoma, to its principal refinery. It operated refineries in Illinois, Arkansas and Louisiana. It owned service stations and bulk plants and its sales offices were located in the key cities of the area. Like its western neighbor and associate, Shell of California, the Roxana was autonomous, self-sufficient, successful.

Thus, the two Shell companies on the North American continent stood as they entered a new year, 1922. Before that year had closed another great milestone was to be passed and Shell was to solidify its American position even further. On January 1, 1922, announcement was made of the purchase of the Union Oil Company of Delaware (not to be confused with Union Oil Company of California) and of the formation of the Shell-Union Oil Corporation as a holding company for the properties of the Shell Company of California, the Roxana Petroleum Corporation and the Union Oil Company of Delaware.

Less than ten years after Shell's entrance upon the American scene it had reached a spectacular climax. A decade after the group had ventured into the producing end of the business in California its activities stretched across the American continent. It was now ready to emerge as the mighty, modern Shell we know today.

Chapter III of this history of Shell of California will appear in the next issue of the California Oil World.

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Field Development

San Joaquin Valley

Second Producer In In Greeley District

The Greeley field in Kern county now has two producing wells. Standard Oil Co. K.C.L. 11-3, located in sec. 20, 29-26, about a half mile to the east of the discovery well, was brought in on May 6, flowing at a 3375-bbl. rate of 46.6 gravity oil, cutting 2%, through a 1-inch casing orifice. Pressures were 1970 lbs. on the tubing and 1780 lbs. on the casing. Gas production was 43,000,000 cu. ft. Production was gradually pinched back and the well was shut in on May 13. The last day's production was 240 bbls., cutting 0.1%, with 2,725,000 cu. ft. of gas. Pressures increased to 2475 lbs. on the tubing and 2430 lbs. on the casing. The gravity of the oil under pressure increased to 59 degrees, flow being through a 14/64-inch orifice. Total depth of the hole is 7868 ft., but it is plugged to 7820 ft. Casing is cemented at 7625 ft., leaving less than 200 ft. of productive zone. The performance of the well was highly gratifying in view of the fact that large amounts of water were obtained on various tests made before final completion.

Discounting the results obtained to date in K.C.L. 11-2, which continues to show mostly water on tests after plugging, operations have been resumed on 11-4, and the well is now drilling below 1200 ft. It is located about 1600 ft. south of 11-3 and more than a half mile to the southeast of the discovery. Location has also been staked for K.C.L. 11-6, in sec. 17, 29-26, about 1320 ft. due north of 11-3. K.C.L. 11-5, to the west of 11-1, is being drilled ahead below 7300 ft. and will be reaching the interesting stage soon.

K.C.L. 12-1, located one mile to the south of the discovery well, showed considerable oil with some water on formation tests. A liner was run and a swabbing test made, but the well would not flow. A compressor is being installed, and the well will be flowed by gas injection. It is believed that a commercial producer can be obtained, though the well may continue to produce considerable water along with the oil. Samples of the water tested show a very low salt content, running only about 40 grains to the gallon. Total depth of the well is 7886 ft., with casing set at 7775 ft.

Derrick Up For Second Test For Edison Extension

Derrick is up for a second well to be drilled by Metro Oil Co. in an attempt to find a northwest extension of Edison, in sec. 6, 30-29, located approximately 700 ft. west of No. 1. The latter is yielding about 20 bbls. of oil with a like amount of water daily from the Kern River zone between 2530 and 2575 ft. It is believed that the second well may be better located.

Eastmont Discovers New Field Near Round Mountain

A discovery of considerable importance was made recently when Eastmont Oil Co. Olcese No. 1, a wildcat test located about one and one-half miles east of Round Mountain in sec. 16, 28-29, was completed on the pump making 500 bbls. of 16.7 gravity oil per day, cutting less than 5% of water and sand. The present production of the well is 350 bbls. The total depth of the hole is 1960 ft., plugged back to 1895 ft., production coming from the Vedder zone, less than 60 ft. of which is open. Work is underway on a second location approximately 440 ft. to the north. The surrounding area is under lease to several different major companies, and it is probable that considerable drilling will result. This area is considered to be entirely separate from Round Mountain, being another accumulation along a paralleling fault.

Seaboard Wasco Wildcat Coring At 9000 Ft.

After encountering the top of the Miocene formation at about 8000 ft., the Seaboard Oil Corp.-Continental Oil Co. K.C.L. C-1 wildcat in sec. 26, 27-24, in the Wasco area, is being cored ahead below 9000 ft. in brown shale. There have been no showings of importance reported in the interval, but it is understood that the well still has possibilities.

Shell Completes New Ten Section Well

Shell Oil Co. completed K.C.L. No. A-23-30, located in sec. 30, 30-26, nearly one mile northwest of the discovery well in Ten Section, on May 7, flowing 2788 bbls. of 31.7 gravity oil daily, showing a total cut of only 0.7%, through two 1-inch orifices, with 2,592,000 cu. ft. of gas. The well was pinched back and is now standing shut in.

Shell now has three wells on production in the field, all flowing at a strictly curtailed rate, with two completed wells standing shut in. All of the wells show cuts of less than 1%, and the gravity of the oil ranges from 35.3 to 41.3 degrees. A recent check of production showed K.C.L. A-1, the discovery well of the area, recently deepened and recompleted, to be making 850 bbls. daily through a 17/64-inch orifice; K.C.L. A-6 flowing 485 bbls. through one 12/64-inch orifice; and K.C.L. A-34, 760 bbls. through a 14/64-inch orifice. These wells are all located in sec. 29. In sec. 30 are found the newly completed well and K.C.L. A-78. The only drilling project active in the field at present is A-58 in sec. 29 which was recently spudded.

Wildcat Near Modesto In Search For Gas

Coast Exploration Co. of San Francisco is preparing to drill another wildcat test for gas in sec. 30, 4s-9e, near Modesto in Stanislaus county. The company recently abandoned a test in the Tracy area.

Pageman & Hennes Quit Test Near Round Mountain

The wildcat test of Pageman & Hennes, located three miles east of Round Mountain, has been abandoned. The well was drilled to about 1150 ft., the formation on bottom being granite, top of which was encountered at 1050 ft. No showings of importance were found.

Reserve Tests No. 33-3 For Possible Gas Plant

In the Tejon area north of the Grapevine in Kern county, Reserve Oil & Gas Co. No. 33-3 averaged 5,000,000 cu. ft. of gas daily on a production test made to test the feasibility of installing an absorption plant. Gasoline content of the gas was three-quarters of a gallon per mcf. This flow was maintained with pressures of 1650 lbs. on the tubing and 1700 lbs. on the casing.

To the north, No. 33-4 is being drilled ahead below 2700 ft. No. 33-2, which showed considerable oil on recent production tests, remains shut in, waiting for results of the drilling of No. 4. The Ohio Oil Co. T.I.T. No. 1, wildcat test two miles to the north of the Reserve wells, is being cored ahead at 8450 ft., with no showings of importance reported. Reserve Oil & Gas Co. No. 2-6, two and a half miles to the southeast of the "33" activity, is in oil sand below 2650 ft., the top of the zone being encountered at 2642 ft.

G. P. Well Makes 230 Bbls. At Mountain View

In the northeast extension area at Mountain View, General Petroleum Corp. Freeport No. 1, sec. 19, 30-29, which was completed recently, is flowing 230 bbls. of 23.8 gravity oil, cutting 12%, from 4852 ft. American Exploration Co. Gilbert No. 1, in sec. 18, 30-29, swabbed wet on a production test from a depth of 4720 ft., and attempts are being made to locate the source of the water.

Miocene Topped In Union Kernco Test

Top of the Miocene formation was encountered at about 7800 ft. in Kernco No. 1-34, wildcat test being drilled by Union Oil Co. in sec. 34, 28-25, about four and one-half miles northwest of Greeley. The hole is being cored ahead below 7800 ft. The next few days should tell the story here.

Cantua Creek Well Testing After Sanding

Western Gulf Oil Co. S.P.L. No. 3, exploratory test north of Coalinga near Cantua Creek in Fresno, which made 400 bbls. of oil and 300 bbls. of water daily on recent swabbing tests, finally sanded up. The hole was cleaned out to 6500 ft., and the water was located entering from that point. The casing was perforated below and cement squeezed into the formation. Another swabbing test was made, but the hole sanded up almost immediately. Further tests are being made.

Mohawk Abandons Test West Of Greeley

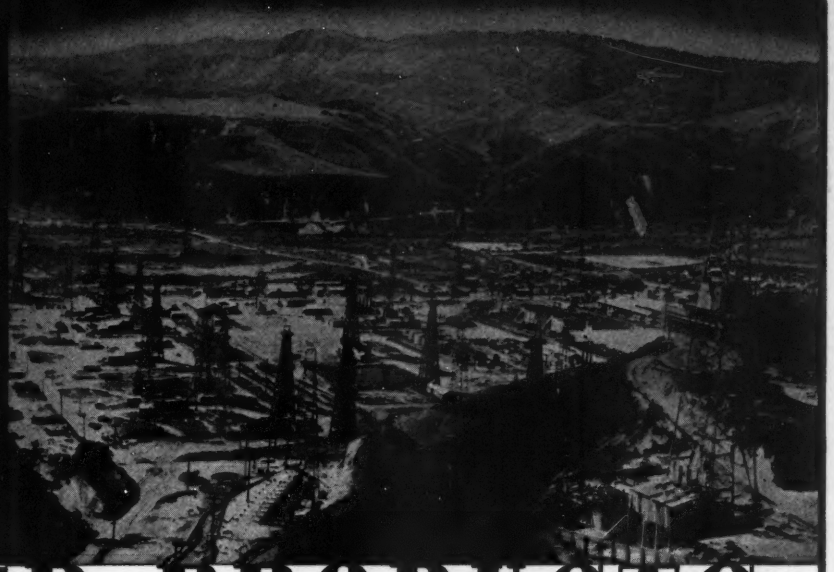
Another test of the San Joaquin Valley floor in Kern county came to an unsuccessful end when Mohawk Petroleum Co. K.C.L. No. 1 was abandoned recently at a depth of 8443 ft. The formation on bottom was barren gray sand, the top of which was encountered at about 8400 ft. This well, which was located approximately two miles west of Greeley, has been watched with considerable interest, but no showings of importance were reported.

Standard Oil Completes McDonald Island Gasser

Standard Oil Co. McDonald Island Farms No. 3, located in the gas field on McDonald Island in San Joaquin county, on a flow test made 7,145,000 cu. ft. through one ½-inch casing bean. The well has been shut in, and the crew will be moved to the next location. The company is preparing to drill Wood Comm. No. 3, located in the Tracy gas field in sec. 24, 1s-5w.

Buttes Oilfields Sticks Pipe In Marysville Well

Drill pipe has been stuck in the deep test of The Buttes Oil Fields, Ltd., located in the Marysville Buttes area in Sutter county. Preparations were being made to test good gas showings near bottom at 5850 ft. when the pipe was stuck.



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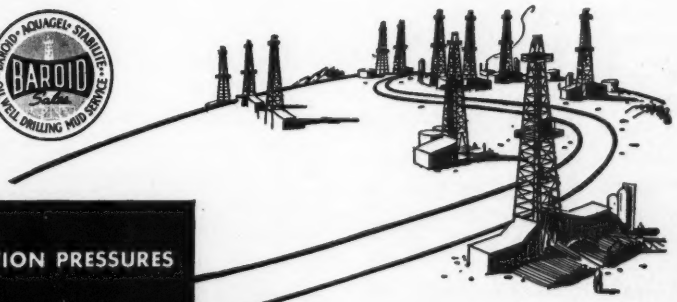

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Los Angeles Basin

Wilmington Active Despite Overproduction

Despite a heavy overproduction of oil which has resulted in a weakened price structure, there has been no decrease in activity at Wilmington. In fact, the opposite is true, with 45 wells drilling and 40 more preparing to start, on a recent count. During the past two weeks there were 31 new locations staked, while 16 wells were being completed. Total production for the field has passed the 36,000-bbl. per day mark, with many of the large wells in the eastern part of the field flowing under curtailment.

Perhaps the most interesting completion of recent date was that of Macmillan Petroleum Co. on the Hayes lease at Anaheim and Eubank streets, which was brought in on May 9, and which is making more than 900 bbls. of clean oil per day. Extending the known productive limits of the field north across Anaheim street in the northwesterly portion of the field, indications are that intensive development may be expected on into the thickly settled portion of the town to the north and west. Geo. F. Getty, Inc. W-8, located south of Anaheim, but a block farther west, has been completed for 600 bbls., while Ring Oil Co. No. 2, a block beyond the Getty well, is flowing more than 700 bbls. Sonwell Oil Co. is preparing to complete a well more than a block to the northwest of the Macmillan well, which is said to look good.

In the area north of Anaheim, west of Alameda street, where Getty W-6 was recently completed as a 1000-bbl. well, offset wells have been completed by both Getty and Bankline Oil Co. with only fair results. Bankline Chuck No. 1, to the west, was good for only 260 bbls., while Getty W-9 to the north is making 300 bbls.

At the opposite end of the field, General Petroleum Corp. has completed its first well on the Interstate lease for 650 bbls., and has staked locations for three more. Union Pacific Railroad has brought in offsets to the northwest and southeast, Nos. 17 and 18, for 700 and 800 bbls., respectively. The best wells of the field continue to be completed in and around the Ford lease in the eastern portion of the present productive area. The most recent of these was Union Pacific Offset No. 7, which was brought in for 1150 bbls.

Other completions include: Royalty Service Corp. Gilmore 17—5-1 for 450 bbls.; Bankline Oil Co. Pac. Terminal Comm. No. 12, in the northeast portion of the field, flowing more than 550 bbls.; Royalty Service Corp. Community No. 5 for 440 bbls.; and Pacific Western Oil Co. Patten No. 2 for 550 bbls. In the extreme northern section where pumping wells are obtained, Olympic Refining Co. has completed Fee No. 1 for 140 bbls.; Premier Petroleum Corp. Selegna No. 3 is making about 200 bbls.; and Sunrise Oil Co. No. 1 is good for about 100 bbls.

Water Shut Off Fails In Dominguez Deep Test

In Dominguez, Union Oil Co. has failed to obtain a water shut off to date on casing cemented in its deep test, Callender No. 50, so no production test has been made. Total depth of the hole is 10,435 ft. with 6⅝-inch casing at 10,050 ft. The casing has been recemented a second time. A successful completion here would prove up nine productive zones in the field.

Shell Plans Northeasterly Test Of Old Olinda Area

Shell Oil Co. will drill a well on the extreme northeasterly edge of the Olinda field. To be known as Columbia 4-1, it is located 140 ft. north and 456 ft. east from the center of sec. 9, 3s-9w.

Four Wells Headed For O'Dea Sand At Rosecrans

There are now four wells drilling for the O'Dea sand in Rosecrans. Barnsdall Oil Co. O'Dea No. 12 was drilled to 6054 ft. and 6⅝-inch casing was cemented at 6035 ft., but the water was not shut off and the well is standing recemented. Union Oil Co. Rosecrans No. 16 was drilled to 5760 ft. and has cemented casing at that point. Bolsa Chica Oil Co. is drilling on the Exeter Oil Co. Wanka lease in the southeasterly portion of the field, while Universal Consolidated Oil Co. has Trust No. 1 below 1000 ft. Derrick is up for A. N. Macrate Gray No. 2.

Barnsdall O'Dea No. 10, the deep sand discovery well of the field, continues to flow 650 bbls. of 36 gravity oil daily through a 22/64-inch orifice, with 1,350,000 cu. ft. of gas.

Shell Oil Co. McKinley No. 1, the wildcat extension test of the area to the southeast, has been officially abandoned, and it is understood that leases are being quitclaimed.

Shell Abandons Mathis 1, Wildcat Near Anaheim

Shell Oil Co. Mathis No. 1, wildcat test just south of the city of Anaheim, has been abandoned after bailing and swabbing tests of oil showings in the zone from 4315 ft. to 4481 ft. failed to develop more than traces of heavy oil. The well was originally drilled to a depth of 5944 ft. into Miocene volcanics, before being plugged back for the final test.

Hildon Well Tests Wet After Deepening To 6142

Hildon Oil Co. Flood Control No. 1, located to the northwest of the Long Beach field, tested wet when a production test was made of 20 ft. of zone on bottom. Machinery is being changed and the well will be plugged back and attempts made to put it on production in the zone previously tested.

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Here are true figures showing increased production from a few typical wells treated with K-D Mudsol:

Production before Treating	Production after Treating with K-D MUDSOL	Increase
60 days—6,382 bbls.	60 days—10,543 bbls.	4,161 bbls.
60 days—2,312 "	60 days— 6,694 "	4,382 "
60 days—1,948 "	60 days— 3,907 "	1,959 "
30 days—2,054 "	30 days— 3,853 "	1,799 "
30 days—1,402 "	30 days— 3,450 "	2,048 "
30 days—2,250 "	30 days— 3,462 "	1,212 "
30 days—1,860 "	30 days— 3,300 "	1,440 "
60 days—4,044 "	60 days— 5,051 "	1,007 "

The gas in above wells showed an increase from 40% to 300%.

Modern trucks are at your service, day or night, anywhere in California.

K-D MUDSOL scientific preparations remove mud, wax, paraffin or scale sheaths from behind the liner, and from the face of the productive oil sand.

Let us give you details of this contribution of Chemical Engineering to Oil Well Production proved by more than 200 successful jobs in California—the obligation will be ours!

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DO YOU HAVE A WELL THAT SHOULD PRODUCE MORE OIL?

El Segundo Interest Centers On West Side

Interest at El Segundo is centered principally on the west side of the field where several wells started after The Texas Co. Security No. 1 completion are nearing the sand. It is generally believed that the future of the field depends on the performance of these wells. The Texas Co. Security No. 2, one location south of the big well, is being cored below 7209, with indications that the conglomerate oil sand had been topped in the core at that point. Republic Petroleum Co. El Segundo No. 8, offset of Security No. 1 to the east, is drilling below 7000 ft.

At the intersection of El Segundo and Sepulveda Blvd., at the northwest corner of the Security lease, Standard Oil Co. Refinery No. 1 is drilling below 5700 ft. Richfield Oil Corp. has Elsie No. 1 ready to spud, while to the north the Ohio Oil Co. A. S. Gough No. 4 is being rigged up. The Texas Co. is preparing to offset these wells with Security No. 3 R. A. Wallace and W. E. Ramsey of Oklahoma are understood to have acquired a 30-acre community townlot lease still farther to the northwest, and to have staked location for a test.

In the southern portion of the field, Union Oil Co. El Segundo No. 2, located 660 ft. west of No. 1, was completed on May 8 for 600 bbls. of 28.6 gravity oil per day from a depth of 7636 ft. Production has since dropped to less than 350 bbls., but the oil is clean. To the southwest, Richfield Oil Corp. is completing Santa Fe No. 1, from a depth of 7640 ft. It is understood that very little sand was present in this hole. To the north a production test is underway on Richfield's El Segundo No. 5.

After repeated efforts to clean out Gough No. 3 had met with failure due to caving and loss of circulation, the Ohio Oil Co. abandoned this location and moved over to drill Gough No. 5 nearby.

Universal Gets Good Producer At Montebello

Another good completion was credited to Universal Consolidated Oil Co. at Montebello when Pasadena No. 1 was brought in from a depth of 5865 ft. for an initial production of 1200 bbls. of 38.3 gravity clean oil per day. Daily production continues to hold around 1000 bbls., with 1,500,000 cu. ft. of gas, the flow said to be coming from the upper portion of the Lower Nutt zone, in which St. Helens Petroleum Co. P & B No. 7 was successfully completed early in March.

Other wells actively drilling in the field at the present time are: Richfield Oil Corp. Ciocca No. 2; The Texas Co. Baldwin No. 10; Universal Consoldiated Oil Co. "F" No. 1; and Wilshire Oil Co. Montebello No. 1, which is being redrilled.

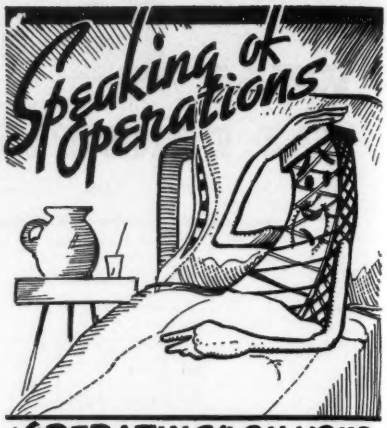
Caltana Wildcat North Of Long Beach Abandoned

The wildcat test of the Caltana Corp., located on property of the Montana Land Co., east of Lakewood and about four miles northeast of Signal Hill in sec. 11, 4s-12w, has been abandoned. The well was drilled to a total depth of 6234 ft., the last few cores showing steep formation dips. Some oil and gas showings are said to have been encountered in the interval from 6090 to 6100 ft., but were not considered sufficient to justify a production test.

Huntington Beach Well Recompleted For 200 Bbls.

Richards & Rowan Severns No. 2, one of the original directed hole completions in the Huntington Beach townlot area, has been taken over by McVicar and Rood, pioneer developers of this type of production in this field, and redrilled from the shoe of the waterstring to 4990 ft. The well was recompleted for 200 bbls. of 24.0 gravity clean oil per day.

(Coast Development on page 22)



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California Crude Oil Production

For Two Weeks Ending May 11, 1937

Field	May Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Belridge—North	13,625	15,346	1,721
Belridge—South	1,995	1,595	*400
Buena Vista	18,245	17,235	*1,010
Coalinga—East	12,115	9,946	*2,169
Coalinga—West	5,405	4,855	*550
Coffee Canyon	4,945	5,572	627
Edison	4,065	4,269	204
Elk Hills	8,910	10,539	1,629
Fruitvale	8,460	9,208	748
Greeley	880	677	*203
Kern Front	10,040	10,419	379
Kern River	5,285	2,418	*2,867
Kettleman No. Dome	81,250	79,163	*2,087
Lost Hills	4,735	3,449	*1,286
McKittrick	3,695	3,638	*57
Midway-Lakeview	9,680	16,972	7,292
Midway-Maricopa	37,545	37,763	218
Mount Poso	15,395	16,810	1,415
Mountain View	19,620	19,432	*188
Round Mountain	7,545	6,301	*1,244
Ten Section	1,985	2,445	460
Other Fields	3,315	3,308	*7
TOTAL	278,735	281,360	2,625
Coastal District			
Elwood	8,550	9,218	668
Rincon	2,330	2,758	428
Santa Maria	13,475	8,513	*4,962
Santa Paula-Newhall	4,815	4,700	*115
Ventura Avenue	32,640	35,475	2,835
Other Fields	5,985	5,516	*419
TOTAL	67,795	66,180	*1,615
Los Angeles Basin			
Alamitos Heights	1,460	1,743	283
Brea-Olinda	9,230	8,458	*772
Coyote—East	2,865	3,564	699
Coyote—West	9,610	7,089	*2,521
Dominguez	25,060	24,648	*412
El Segundo	2,435	5,411	2,976
Huntington Beach—New	17,860	21,613	3,753
Huntington Beach—Old	14,890	17,207	2,317
Inglewood	15,840	14,822	*1,018
Long Beach	57,730	60,798	3,068
Montebello-Extension	8,865	9,400	535
Playa Del Rey	8,960	9,236	276
Richfield	7,710	8,469	759
Rosecrans-Athens	2,135	2,959	824
Santa Fe Springs	40,440	45,690	5,250
Seal Beach	7,935	7,702	*233
Torrance-Hermosa and Extension	7,070	7,418	348
Wilmington	13,460	34,666	21,206
Other Fields	2,145	2,266	121
TOTAL	255,700	293,159	37,459
STATE TOTAL	602,230	640,699	38,469

*—Shortage

Standard Gets Good Well At Inglewood

Another good well was completed by Standard Oil Co. on the Los Angeles Investment lease at Inglewood when No. 82 was brought in recently for an initial production of 1162 bbls. of 31.8 gravity clean oil per day from a plugged depth of 3836 ft. Production increased to more than 1400 bbls. per day before being curtailed.

Metropolitan del Rey Extension Down 6200 Ft.

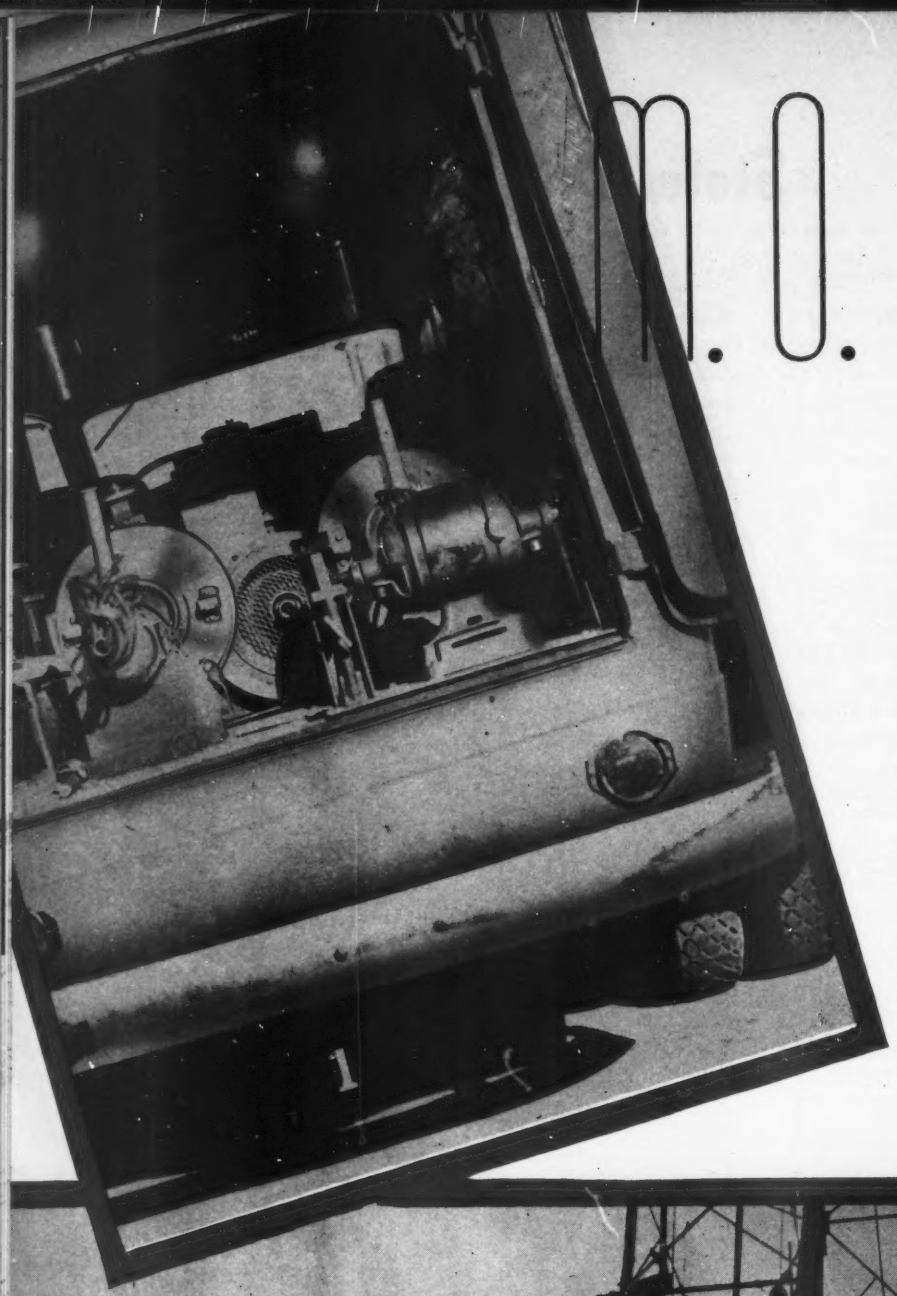
Metropolitan Oil Co. of Venice is drilling an extension test to the southeast of Playa del Rey, near the northeast corner of sec. 34, 2s-15w. The well is now below 6200 ft.

State Drilling Report

Field	Company	Well	No.	Sec.	Twp.	Range
		NEW WELLS				
Wilmington	D. D. Dunlap		W-1	33	4 S	13 W
			W-2	32	4 S	13 W
	Packard Petroleum Co.		3	33	4 S	13 W
	Royalty Service Corp. Gilmore		460-1	33	4 S	13 W
		Santa Fe	A-1	33	4 S	13 W
		Nelson	B-1	33	4 S	13 W
		Community	7	32	4 S	13 W
	Pacific Western Oil Co.	Wilmington Com.	1	33	4 S	13 W
		Pet. Securities	1 & 2	33	4 S	13 W
	Bankline Oil Co.	Pac. Term. Com.	32	33	4 S	13 W
	Union Pacific R. R.	Offset	25 & 26	33	4 S	13 W
		Offset	27 & 28	4	5S	13 W
	Gus Pongratz	Ronan Tct. Com.	2	32	4 S	13 W
	Ring Oil Co.	Wilmington	3 & 4	33	4 S	13 W
	J. E. O'Donnell	O'Donnell	41	32	4 S	13 W
	Olympic Refining Co.	Fee	2 & 3	33	4 S	13 W
	Crude Oil Drilling Co.	Mason	1	33	4 S	13 W
	General Petroleum Corp.	Ford	6	4	5 S	13 W
		Patten	3	4	5 S	13 W
Rosecrans	Bolsa Chica Oil Corp.	Exeter	3	20	3 S	13 W
Richfield	Arrowhead Oil Co.	Bradford	1	32	3 S	9 W
	Union Oil Co.	Morse	10	29	3 S	9 W
Huntington Beach	The Texas Co.	Brown	9	11	6 S	11 W
Orange County	West American Oil Co.	Irvine	1	Irvine		Ranch
El Segundo	Standard Oil Co.	Refinery	1	13	3 S	13 W
Long Beach	A. T. Jergins Trust		29	19	4 S	12 W
Imperial County	Pacific Imperial Dri-Ice, Inc.		8	13	11 S	13 E
Ventura County	The Texas Co.	Lloyd-Butler	2	31	3 N	21 W
	El Rio Oils (Canada) Ltd.	El Rio	1	6	1 N	21 W
Capitan	Shell Oil Co.	Covarrubias 1	22	32	5 N	30 W
Santa Maria	Union Oil Co.	Squires	19	26	9 N	34 W
Santa Maria Valley	Union Oil Co.	Russell	1	21	10 N	34 W
	Sed Oil Co.		1	27	10 N	34 W
Cat Canyon	O. C. Field Gasoline Corp.	Continental	2	4	8 N	32 W
	The Petrol Corp.	Tognazzini	43-A	9	8 N	32 W
Mesa	Oatman Rainbow Gold Mining Co.	Midwestern	1	28	4 N	27 W
Santa Cruz County	Elba Oil Co.	Elba	1	6	12 S	1 E
McKittrick	East Puente Oil Co.	Lease No. 2	11	11	30 S	21 E
Midway	Standard Oil Co.		47 & 126	33	32 S	24 E
	Honolulu Oil Corp.		52	14	32 S	24 E
	Quality Oil Co.	Cypress	5	22	32 S	23 E
Devil's Den	Amerada Petroleum Corp.		4	17	26 S	19 E
Sunset	Ethel D. Co.		43	36	12 N	24 W
Mount Poso	General Petroleum Corp.	Heisen	7	16	27 S	28 E
	Vanguard Oil Co.	Baker	7	33	27 S	28 E
	Shell Oil Co.	Vedder-Rall	12	17	28 S	29 E
		Vedder	32	9	27 S	28 E
	Ring Oil Co.	Bowles 29	2	29	26 S	28 E
Kern River	General Petroleum Corp.	Young	53	13	28 S	27 E
	The Texas Co.	Lehmann	7	23	28 S	27 E
	California Star Oil Co.		8-40	22	28 S	27 E
Ten Section	Shell Oil Co.	KCL-A	58-29	29	30 S	26 E
Fruitvale	Pal-Pen Oil Co.	Pal-Pen	2	23	29 S	27 E
	Western Gulf Oil Co.	Sawyer & Reed	3	27	29 S	27 E
	C. J. Gardner & John R. Powell		1	23	29 S	27 E
Round Mountain	Shell Oil Co.	Olcese 1	10 & 11	17	28 S	29 E
Poso Creek	Desert Glow Oil Co.		1	14	27 S	27 E
Edison	North American Oil Cons.	Brown	4	14	30 S	29 E
Mountain View	Tracy Drilling Corp.	Blackburn	1	19	30 S	29 E
	Hogan Petroleum Co.	Symons-Bankline	3	4	31 S	29 E
Kern County	Reserve Oil & Gas Co.		33-4	33	11 N	19 W
Tulare County	Trico Oil & Gas Co.	Valley	1	36	21 S	25 E
Solano County	Amerada Petroleum Corp.	Marks	1	24	4 N	2 E
Humboldt County	Bushnell Oil Corp.	Daisy Cook	1	28	1 S	2 W
		DEEPEN OR REDRILL				
Huntington Beach	The Petroleum Co.		2	10	6 S	11 W
	Metro Oil Co.		1	2	6 S	11 W
	James E. Ford	Ford	4	10	6 S	11 W
anta Fe Springs	Union Oil Co.	Alexander	31	6	3 S	11 W
	The Texas Co.	Matern 3	12	6	3 S	11 W
	Geo. F. Getty, Inc.	S. F. S.	36	5	3 S	11 W
	A. Wardman	Springs	1 & 2	6	3 S	11 W
Richfield	Standard Oil Co.	Kraemer 2	16	32	3 S	9 W
Long Beach	Delaney Petroleum Corp.	Chief	2	30	4 S	12 W
	Jahns Drilling Corp.	Jahns	2 & 3	24	4 S	13 W
	Aztec Drilling Corp.	Aztec	1	29	4 S	12 W
Santa Paula	Wheeler Canyon Oil Co.		15	25	4 N	22 W
		Henderson Union	16	25	4 N	22 W
Midway	G. & M. Oil Co.		4	32	32 S	24 E
	Vista Grande Oil Co.	Schultz	5	22	32 S	24 E
Mountain View	Mohawk Petroleum Co.	Mabry	1	24	30 S	28 E
		ABANDON				
Seal Beach	Pacific Western Oil Corp.	Bryant	4-A	3	5 S	12 W
Long Beach	J. E. O'Donnell	O'Donnell	48	18	4 S	12 W
Richfield	Arrowhead Oil Co.		3-B	32	3 S	9 W
Santa Fe Springs	Ring Oil Co.	Patterson	4	6	3 S	11 W
Orange County	Speik Oil Co.	Derby	1	9	6 S	10 W
Riverside County	Great Coastal Oil Corp.		1	36	5 S	5 W
San Luis Obispo County	A. T. Jergins Trust	Indian Knob	1	26	31 S	12 E
Elwood	Bankline Oil Co.		191-2	25	4 N	29 W
Mesa	Fair Mesa Oil Co.	Gray	1 & 2	28	4 N	27 W
Midway	Blanck & McDonald		1	32	31 S	23 E
	North American Oil Cons.		5	28	31 S	23 E
Kern County	Mohawk Petroleum Co.	KCL	1	23	29 S	25 E
		Earl Fruit Co.	1	10	31 S	29 E
	Standard Oil Co.	KC 14	1	4	30 S	26 E
	Signal Oil & Gas Co.	KCL	A-1	21	30 S	27 E
Kern River	Geo. Terry & Associates	Central Point	1-A	4	29 S	28 E
	Pioneer Oil Co.		3	18	28 S	28 E
Poso Creek	Allied Petroleum Corp.	Allied	21	29	27 S	27 E
San Joaquin County	Coast Exploration Co.	TF	1-1	2	3 N	4 E

Summary	Past Two Weeks	Previous Two Weeks	To Date This Year	To Date Last Year
Total New Wells	71	67	557	352
Total Deepened or Redrilled	18	34	259	323
Total Abandoned	20	13	180	183

M. O. JOHNSTO



The severe service to which drill pipe is subjec
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safe joints which induce excessive thread wo
irregular pin strains, and allow fluid leaks th
quickly ruin threads and shoulders.

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night work and a gasoline-driven generator to suppl
current. Each refacing machine mounts directly upo
a MASTER GAUGE, which in turn, screws into th
box or pin of the tool joint. A geared electr
motor drives a rotating member carrying the cutti
tool, and the amount of cut is automatically dete

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TOOL JOINT REFACING SERVICE

is subject ed by the master gauge, assuring A PRE- d and wo ON JOB ON EVERY JOINT. Moreover, -loose, e the machine is rigidly centered upon the read wo ads, the new face is always in exact alignment leaks th the threads themselves.

l Compa The operation of cutting each joint requires but a accurate minutes, and the refacer leaves a smooth finished on Servi ace that shoulders evenly to give a fluid-type compl d joint, good for another long period of efficient gauges t vice.

ators wo Showing complete equipment mounted in truck.

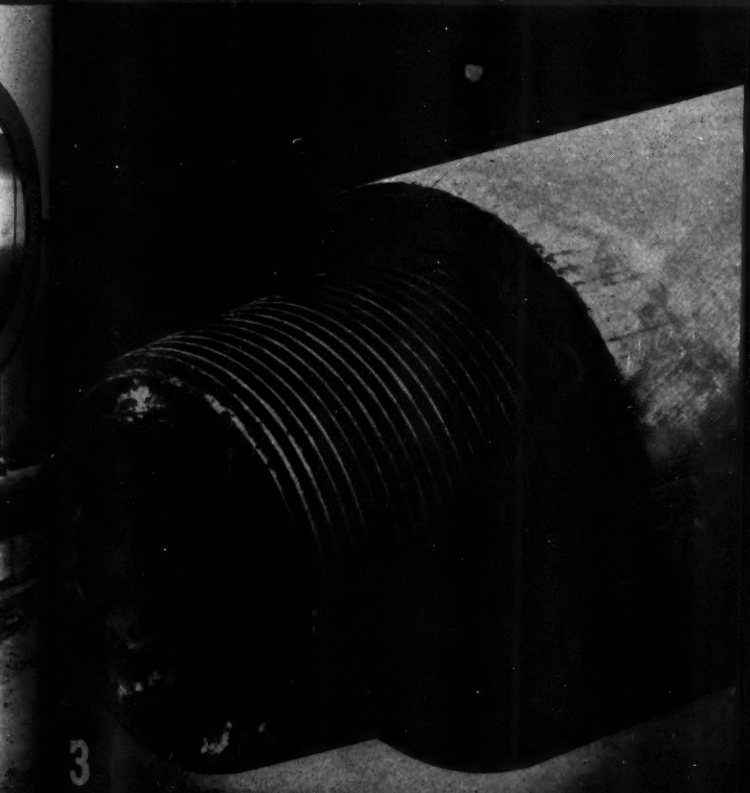
lights Equipment set up in the field. Inset—Refacer in operation.

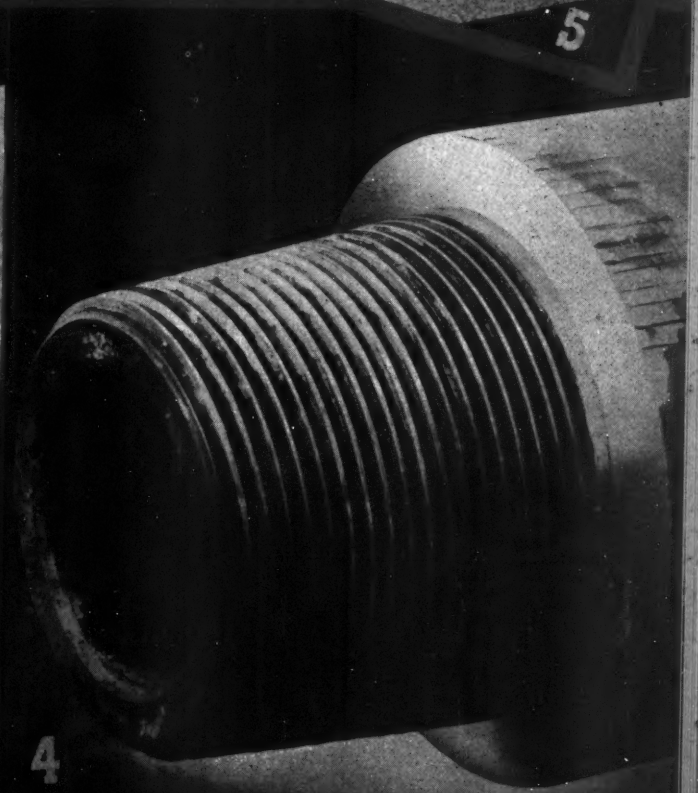
to supp ectly upo Tool Joint before refacing.

vs into th d electri Same Joint after refacing.

he cutti lly dete Refaced drill string ready for further service.

"Prepared by Dozier-Graham & Eastman".





Coastal District

Santa Maria Stimulated By Union O'Donnell Well

Interest in the Santa Maria Valley area is at a high pitch following the successful completion of Union Oil Co. O'Donnell No. 1, two miles west of Adam. While there have been no important drilling developments during the past two weeks, leasing has been very active to the south and west of the city of Santa Maria, and it is understood that nearly all available acreage within the radius of several miles is under lease, presaging active exploration over the entire area.

The O'Donnell well on the old Paderewski Ranch on sec. 21, 10-34, continues to pump more than 200 bbls. of 17.1 gravity oil per day, showing a total cut of only 1%, from a depth of 4147 ft. Union's second well, Russell No. 1, is located in the southeast corner of the Ed Russell lease, just south of the O'Donnell holdings, and is now drilling below 2500 ft. With this type of accumulation it is presumable that this well will make a better producer than the discovery, due to the thickening of the Monterey series to the south, with a subsequent greater amount of productive horizon from which to draw.

The initial test of Cohn and Mitchell has been spudded in on the Giacomini ranch in sec. 18, 10-34, approximately two miles west of the O'Donnell well. This wildcat is being watched with considerable interest, as it is thought to be favorably located. Pacific Western Oil Co. is preparing to drill immediately on the E. Hobbs property in sec. 21, 10-34, to the southeast of the Russell well. The location is to be staked as soon as the property has been surveyed. A well is being started by Sed Oil Co. of Long Beach on a narrow strip of property in sec. 27, 10-34, about a mile westerly from the nearest production at Adam. Several other projects are scheduled to be started in the general area in the near future.

The well now being drilled by the R. R. Bush Co.-Hancock Oil Co. combination on the Bradley property in sec. 26, 10-34, is the most important one underway in the Adam area at the present time. A successful completion here would extend the known productive limits of the field one-half mile to the south. Top of the Monterey was encountered at about 4100 ft. The outlook is said to be favorable.

Vincent No. 2, the most recent completion of Union Oil Co. in the field, has proven to be something of a disappointment. The well, which is located in the southeasterly portion of the field, offsetting the R. R. Bush-Hancock California Lands No. 1 to the north, was brought in on the pump, and is now making about 75 bbls. of 15.5 gravity oil per day. Other wells being drilled by Union are Vincent No. 3, to the west of No. 2, and Enos 3-23, offsetting the recently completed A. N. Macrate Fernandez No. 1. Both are below 3000 ft. with water string set, and should be completed soon.

Associated To Drill Santa Rita Hills Well

A wildcat will be drilled by Tidewater Associated Oil Co. in the Santa Rita Hills area east of the town of Lompoc in Santa Barbara county. Operations are underway in the se¼ of sec 3, 6n-33w, the well being known as Leonis No. 1. It is understood that the company has approximately 2000 acres under lease. Several years ago a well known as J. T. Hurst No. 1 was drilled about a mile to the west, and abandoned at 3515 ft. Ohio Oil Co. drilled Salsipuedes No. 1 to a depth of 4650 ft. five miles to the west, near Lompoc.

Barnsdall Gato Ridge Wells On Production

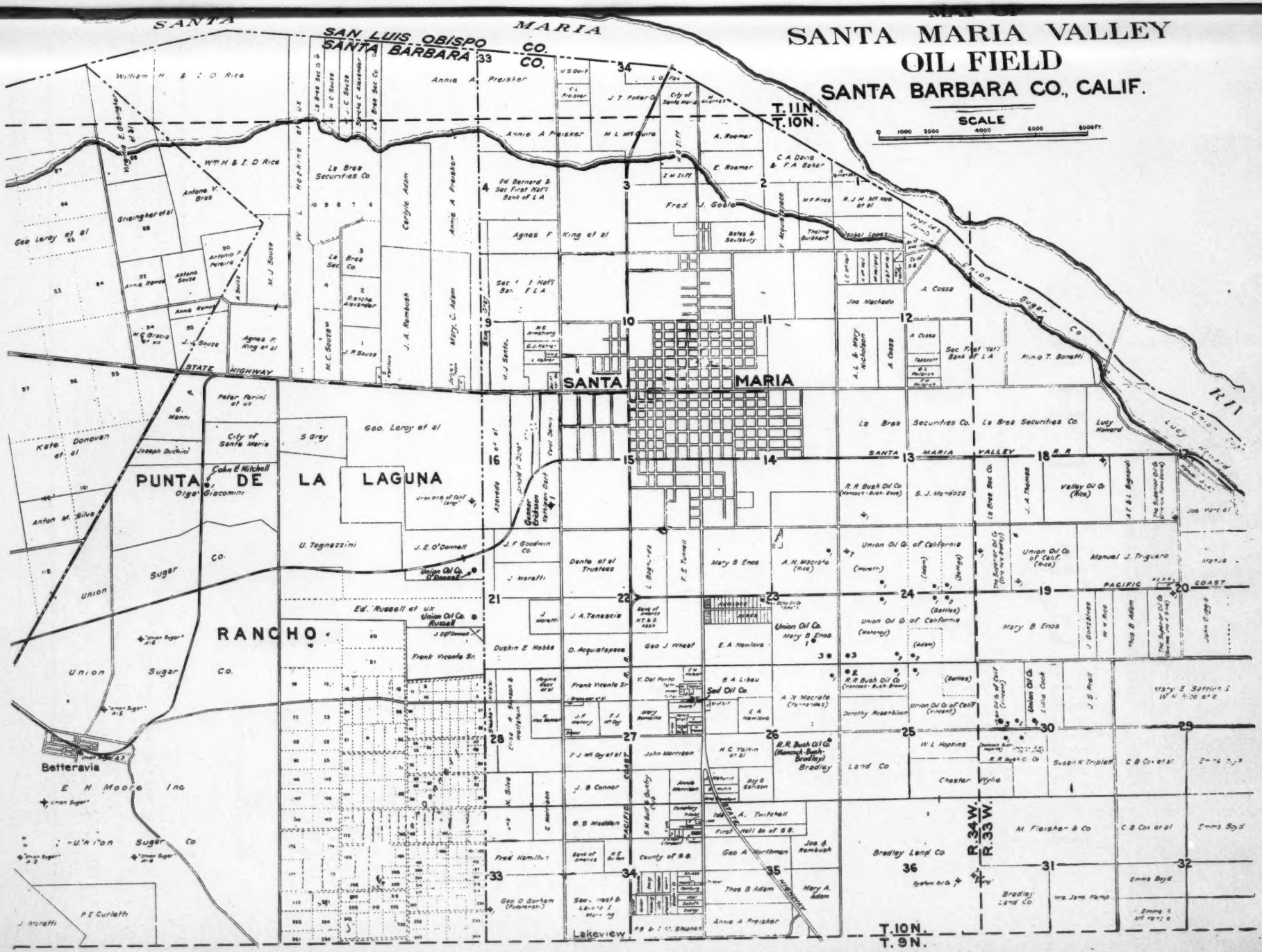
At Gato Ridge, Barnsdall Oil Co. has completed Tognazzini Nos. 6 and 8 as good producers from depths of 2515 ft. and 2625 ft. respectively, both having potentials of more than 1000 bbls. Tognazzini No. 43A of The Petrol Corp. is ready for completion. In the northern portion of the field, recently extended by the commercially productive Continental No. 1 of O. C. Field Gasoline Corp., the company is preparing to drill No. 2, approximately 660 ft. to the northeast in sec. 4, 8-32. In the same section, Well No. 1 of the Moyle Oil Co. was put on a production test from a depth of 3233 ft., but showed only a small amount of oil, and is being deepened through the liner. Operations have been resumed on the well being drilled by Stewart-Carter Oil Co., and it is being deepened below 3600 ft. Casing is set at 2150 ft. This well stood idle for some time while the company was being reorganized.

Merchants Completes Sespe Canyon Well

Well No. 6 of the Merchants Petroleum Co., located in Sespe Canyon, in sec. 1, 4-20, has been completed from a depth of 980 ft. and pumps for several hours per day at a 400-bbl. rate. The gravity of the oil is 15.5, and the cut 1%. The well was drilled with cable tools.

Gretna Deepening Morro Wildcat After Test

Heavy oil and tar sand was encountered at 990 ft. in the wildcat being drilled by Gretna Corp. near Morro Bay in San Luis Obispo county, and a formation test was made of the interval from 910 ft. to bottom. However, due to the fractured nature of the formation, the test was not conclusive, and the hole is being deepened.


SANTA MARIA VALLEY
OIL FIELD
SANTA BARBARA CO., CALIF.
SCALE
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SAN LUIS OBISPO CO.
SANTA BARBARA CO.
SANTA MARIA
T. 11N.
T. 10N.
R. 34W.
R. 33W.
T. 10N.
T. 9N.
STATE HIGHWAY
SANTA MARIA
SANTA MARIA VALLEY R.R.
PACIFIC COAST R.R.
PUNTA DE LA LAGUNA
RANCHO
Betteravia
Lakeview
Union Sugar Co.
La Bree Securities Co.
Union Oil Co. of California
R.R. Bush Oil Co.
Bradley Land Co.
Valley Oil Co.
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Union Oil Co. Russell
Union Oil Co. O'Donnell
Union Oil Co. Mary B. Enos
Union Oil Co. Bradley
Union Oil Co. Mahoney
Union Oil Co. Adam
Union Oil Co. Bettes
Union Oil Co. Vincent
Union Oil Co. Rice
Union Oil Co. Lillis Cook
Union Oil Co. Frances-Bush-Brown
Union Oil Co. Hancock-Bush-Enos
Union Oil Co. Hancock-Bush-Bradley
Union Oil Co. Hancock-Bush-Enos
Union Oil Co. Hancock-Bush-Brown
Union Oil Co. of Calif. Rice
Union Oil Co. of Calif. Vincent
Union Oil Co. of Calif. Lillis Cook
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Union Oil Co. of Calif. Hancock-Bush-Enos
Union Oil Co. of Calif. Bettes
Union Oil Co. of Calif. Adam
Union Oil Co. of Calif. Mahoney
Union Oil Co. of Calif. Bettes

LAUGH THIS OFF

Stopped by a motor cop for speeding, a certain lad from the Huntington Beach district explained that he was rushing to see his lawyer. "Swell," said the callous cop, "You'll have more news for him now."

And **"Jud" Saatjian** says there are two distinct types of men in the oil business —those who wear golf pants, and those who have seen pictures of themselves wearing golf pants.

"Jud", by the way, explains that the Scotch are all good golf players because of the simple fact that the fewer times the ball is hit the longer it lasts.

"Are you in town for good?" asked the city lad, and his newly found acquaintance answered, "Heck no, I'm a pumper, and this is my day off."

Incidentally, did **Percy Lea** ever tell you about the golfer who killed his wife for poking the fire with his mashie? It seems that the guy was eventually sentenced to be hanged, and true to his creed he requested permission to make a few trial swings before the job was started.

And **Red Wilson** says the proper handling of a gauge tape is a matter that is not easily acquired. It's something that has to be taut.

While **R. D. Mathews** declares the only real rest a fellow gets in these hectic times is while he is waiting for the red light to turn to green.

All choking aside, however, with so much of this quick starting gasoline floating around, people ought to be able to snooze for an extra ten minutes every morning.

Ed Gieck is very proud of the fact that he has finally discovered why automobile drivers are invariably in a hurry. It seems that they are hurrying to get out in front of the car ahead so they can slow down.

Harry Pegors, on the other hand, claims that a field worker down in Torrance fainted the other day, and when the doctor brought him to he drank both of them.

And ever since a certain construction man was reported to be home with a case of neuritis, hundreds of people have been calling on him, hoping, we suppose, to get a snifter. It might save further embarrassment if we make it clear now that neuritis is a disease, not a refreshment.

Bill Eggleston says he has been examing cores ever since he was old enough to eat apples.

A Santa Fe Springs boy has just married a dairymaid from the Hynes district. He apparently curd for her in a big whey.

It's straw hat time, we are told, and you know even a drowning man has enough sense to clutch at a straw.

And **Neil Norris** tells us the distressing story of a family man whose son was out playing marbles with his glass eye, just when he needed it to look for work.

It was **Neil**, you know, who first pointed out the fact that a traveler's check and a flat tire are two entirely **different** things.

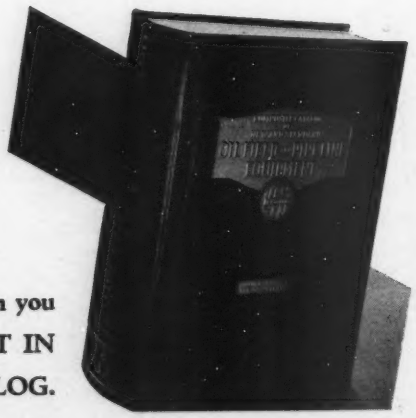
Saying which we now tender some good safety advice from **W. L. McLaine:** Never stop to tie your shoe lace when you are going through a revolving door.

David Day has just phoned to say that a well-known Scotchman has bought the Thousand Islands, and is on his way out to count them.

With which few remarks we leave you, but before we do, get this clear. You won't lose control of your car so easily if you keep up the payments.

And while a receding chin may not denote strength, it is mighty convenient when you're eating corn on the cob.—R. S.

PRESTO!



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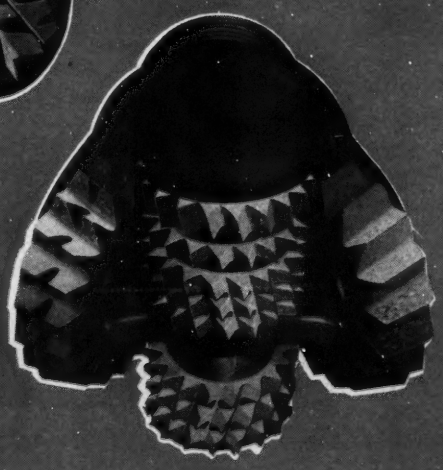
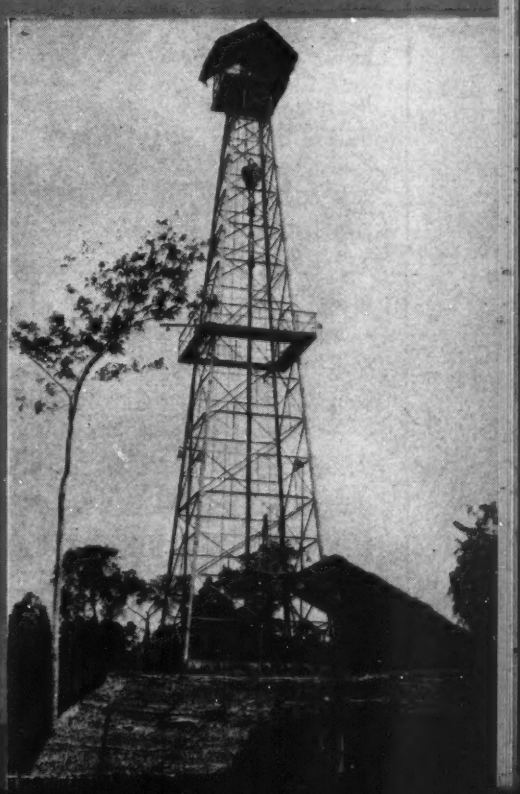


REED DK ROCK BITS ARE GETTING THE JOB DONE FASTER AND AT LESS COST



REED ROLLER BIT CO.

Merriam Signs Olson Bill; O'Donnell Bill Fails To Pass

Director of Finance preparing questionnaire to be filled out by companies submitting bids; state can enter oil business if no bids qualify.

Governor Merriam has signed the Olson tideland bill, opening the subsea pool off Huntington Beach to development by successful bidders for the 11 parcels into which the area is divided by the terms of the bill.

There was a last minute attempt to rush the O'Donnell bill through the legislature, in order that the Governor might have a choice of bills to sign, but the attempt failed, the Olson bill becoming law. Under the terms of the bill, which was passed as an urgency measure and hence is not susceptible of referendum, the state will accept bids for the parcels, on a sliding scale of royalty up to production of 200 bbls. per day, with greater production paying a minimum royalty. The parcels each represent about one-quarter of a section, and the Olson bill requires that the successful bidder must drill at least 10 wells per parcel. The drilling is to be done from piers or islands, and is not to be done from the uplands by modern methods of directed drilling. In the event that no bid is received for any parcel, or the terms of the bids received do not qualify, the state is empowered to go into the oil business and drill the wells for itself, probably through contract.

The State Director of Finance will accept bids for operations under the bill. In submitting bids, operators must also fill out a questionnaire which will determine whether they are fit bidders, this questionnaire also being under construction by the finance driector.

In this whole question of tideland drilling, another matter of considerable interest is rapidly gaining prominence. That matter is—Just who owns the oil in the tidelands, anyway? Up to date the general assumption has been that the state owned the tidelands, but there have been several recent moves to question this doctrine. There is a bill at present in the U. S. Senate which seeks to claim the tidelands for the Federal government in the event that the investigation now underway in the Interior Department and the Department of Justice does not lead either of these agencies to claim them.

There is some question, also, according to Robert M. Pease, local oil attorney, as to just what constitutes the tidelands as they are commonly called, and whether permits that apply to them also apply to drilling farther out to sea.

6200 FEET IN 14 DAYS!

Hold on there, Pal, that's a lot of hole to drill in two weeks.

But it has just been done in the El Segundo field by one of the up-and-at-em big oil companies.

How?

By maintaining, day in and day out, a constant flow of dry steam.

Yes, yes, but how did they do that?

Installed Campbell Feed-Water Controllers. They hold the level to within a half-inch of any mark you set. Spudding in, idling, or drilling —it's all the same to a Campbell Cantilever Controller. It's the level-holdingest regulator you ever did see. That's why it's called a Controller.

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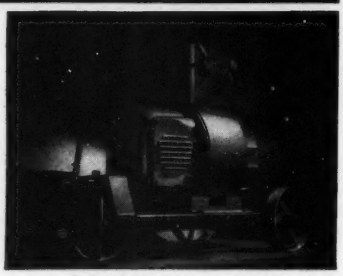
THE ONLY WELDER THAT GIVES YOU ALL 3



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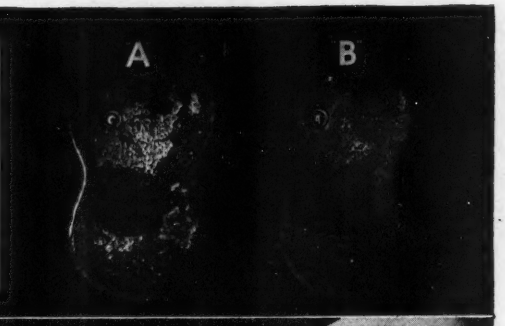
GENERAL ELECTRIC

4 WAYS TRITON *Saves You Money!*

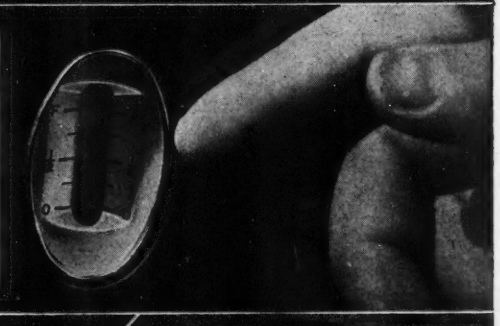
1. SAVES CARBON SCRAPES

"A"—cylinder head of car driven 6,000 miles with other oils. Note heavy carbon causing car to "ping" badly. "B"—same cylinder head 3,000 miles after motor was switched to Triton. Most carbon has burned out. *Knocks have stopped.*



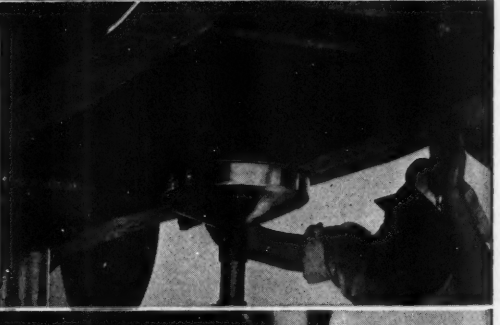
2. SAVES GASOLINE

Many cars have spark retarded to suppress carbon "ping." Triton allows correct advance setting of spark without "pinging." Result: You get the mileage, power and efficiency your motor was designed to give.



3. SAVES OIL DRAINS

Triton saves oil because it has extreme resistance to "breaking down." It is a safe, full-bodied oil long after many oils are worn out. Should you neglect to drain crankcase at customary time, don't worry about Triton.



4. SAVES MOTOR WEAR

Fleet operators and technically-minded persons, who keep accurate records, report Triton saves money—reduces motor wear, minimizes repairs, gives freedom from carbon troubles.

—Gives you BETTER LUBRICATION *plus* FREEDOM FROM CARBON KNOCKS!

CARBON causes your motor to knock. Knocks reduce power, waste gasoline with every mile and are damaging to your motor.

Sludge gums piston rings, sticks valves, plugs oil lines and causes excessive wear.

Unlike most oils, Triton cannot form harmful carbon or sludge. It contains none of the low-grade materials that cause a motor oil to break down in use.

Triton is Propane-Solvent refined...100% PURE Paraffin-base ...100% PURE lubricant...so pure, motors easily burn away the small amount of carbon formed. It gives the finest type of motor protection money can buy—PLUS freedom from carbon knocks and all the waste and damage knocks cause.

Try Triton next time you buy oil.

UNION OIL COMPANY

100% PURE PARAFFIN-BASE

March Taxable Gasoline Sales Show Increases Over February

Figures for first quarter of 1937 show increase in sales over like period of 1936.

Total sales of taxable gasoline amounted to 144,654,896 gallons during March, bringing sales for the first quarter of 1937 to a total of 389,129,886 gallons. The March gallonage was 28,711,629 greater than for the preceding month, but approximately 2,500,000 gallons less than for the same month last year. The state levied assessments of $4,296,250.45 on March gallonage, bringing the total tax for the first quarter to $11,557,157.91.

On a daily average basis, sales for the first quarter of this year were 4,323,665.40 gallons, an increase of 100,909.63 over daily sales of 4,222,755.77 gallons during the January-March period of last year. In terms of barrels, sales during the first quarter of 1937 totalled 102,944.41, against 100,541.80 in 1936. On a three-to-one basis, the rule-of-thumb method of transposing gasoline statistics into crude statistics, the motorists of the state required 308,833.23 bbls. of crude oil daily during 1937's first quarter and 301,625.40 bbls. per day during 1936.

Out of the 165 distributors of gasoline listed by the State Board of Equalization, 34 sold 300,000 or more gallons of taxable gasoline during March. These companies, in order of taxable sales, were:

	Taxable Gallonage	Total Sales
Standard Oil Co.	24,716,800	63,661,072
Shell Oil Co.	17,117,174	24,429,855
Union Oil Co.	14,241,804	18,929,970
Tidewater Associated Oil Co.	14,135,720	19,608,095
General Petroleum Corp.	11,282,314	22,968,053
Richfield Oil Corp.	13,178,990	15,467,604
Wilshire Oil Co.	8,206,141	8,123,547
The Texas Co.	8,097,453	18,324,585
Mohawk Petroleum Co.	4,250,868	4,331,971
Hancock Oil Co.	3,188,550	3,323,569
Caminol Co.	2,421,039	2,442,675
Macmillan Petroleum Corp.	1,842,049	1,885,944
Rio Grande Oil Co.	1,720,619	1.640,018
The Norwalk Co.	1,654,753	2,368,943
Seaside Oil Co.	1,499,438	3,892,551
Estado Petroleum Corp.	1,480,417	1,465,613
Exeter Refining Co.	1,291,223	1,271,846
R. R. Bush Oil Co.	1,202,808	1,190,900
St. Helens Petroleum Co.	1,124,290	1,105,561
Bachmann Petroleum Co.	1,077,047	1,066,277
M. M. McCallen	1,070,365	1,059,661
Envoy Petroleum Co.	1,009,805	999,707
Operators Oil & Refining Co.	905,509	896,454
El Tejon Refining Co.	877,340	868,949
Socal Oil & Refining Co.	808,538	800,453
Ajax Oil & Refining Co.	764,648	757,002
Rothschild Oil Co.	703,241	696,209
Triangle Oil & Refining Co.	639,359	629,996
Olympic Refining Co.	550,790	777,185
Los Nietos Producing & Refining Co.	504,430	3,555,535
Elm Oil Co.	469,817	465,119
Eagle Oil & Refining Co.	440,884	436,476
J. O. Moffett	407,347	403,323
Harbor Refining Co.	373,220	383,874
All others	1,403,106	
Total March	**144,654,896**	**236,828,592**
Total February	115,943,267	
Increase	28,711,629	
Total to Mar. 31, 1937	**389,129,886**	

Suit Tests Power Of Fair Trade Act

The first test of the California Fair Trade Act, at least insofar as it applies to the oil industry, will be made by the Retail Petroleum Dealers Association in an action now in court. The Association, in conjunction with Edgar E. Engle and Clarence R. Nelson, operators of a service station, has brought suit to stop Howard Cook, operating another service station in the neighborhood, from selling gasoline at a price less than that stipulated in his contract with the Richfield Oil Corp.

The complaint alleges that by selling at less than the stipulated price, Cook is jeopardizing the business of the plaintiffs, and that continued selling at a lower price will ultimately result in the weakening and possible destruction of the gasoline price structure.

Richfield Oil Corp. is not a party to the suit in any way. The part it is playing is as the supplier of the gasoline, under the regular contract which states that the dealer must resell it at the stipulated price. Other gasoline contracts follow the same general line, the penalty for not maintaining the price being the refusal of the supplier to furnish gasoline.

GOODALL "NEWTYPE CORD"

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MODERNIZE with GOODALL Curb Pump Hose—the original "NEWTYPE" Construction. It's often imitated—but never equalled because the patented construction cannot be duplicated. Made especially for dispensing regular and high-test gasoline at curb pumps, GOODALL "NEWTYPE" will not soften or disintegrate. It is serviceable, attractive, easily cleaned, and has proved itself a profitable investment in thousands of service stations.

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Improving Absorption Plant Cycle With Direct Fired Heat

By E. G. Ragatz and D. E. McFaddin, Union Oil Co.

Process engineers speculating upon direct fired heat in absorption plants. Method Union Oil Co. finds successful described by engineers in close touch with its development and operation.

For several years past, process engineers working with absorption plant layouts have been speculating as to the desirability of utilizing direct fired heat for the operation of the absorption plant distillation equipment. Union Oil Co. of California has been operating such a direct fired heater installation at its Dominguez absorption plant for the past year with considerable success. This paper presents a detailed analysis of that particular equipment's operation.

Accompanying figure I presents a simplified flowsheet of the Dominguez installation, while figure II presents a photographic view of its main distillation equipment. As indicated on the simplified flowsheet, the Dominguez installation employs a conventional hook-up of absorbers and interchangers operating in conjunction with a special hook-up of fixed gas fractionator, combination fractionating and stripping still, and direct fired heater. In the photograph of figure II can be seen the combination fractionating and stripping still, with the plant's centralized control board and pump block in the foreground. Just back of the main stripping still is the shorter fixed gas fractionating column, and back of this the gasoline accumulator. A portion of the cooling tower appears in the background. This photograph gives an excellent conception of the compactness of the Dominguez distillation equipment layout.

Figure III presents a photograph of the fired heater used in this plant. In designing this heater, which is a simple baffled up-draft type of unit, special care was taken to limit the density of heat input to the radiant tubes to a maximum of 10,000 Btu's/sq. ft. Needless to say, only a well designed low maximum heat density heater should be used on services of this character.

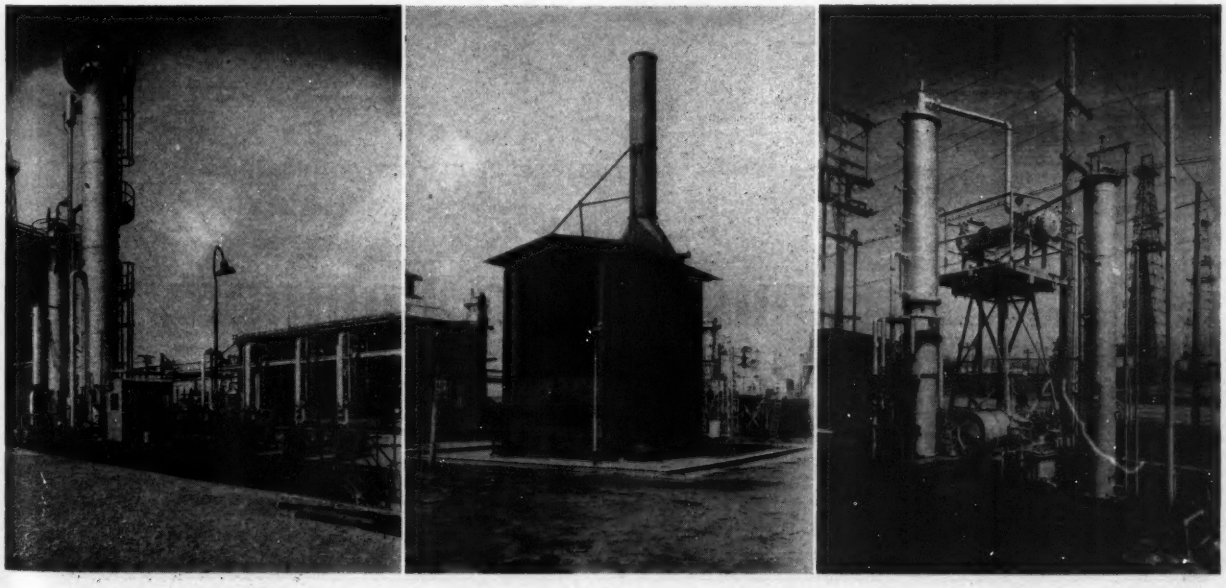
As indicated on the flowsheet of figure I, the present Dominguez installation employs exhaust steam for the final stripping of the lean oil at the main stripping column, consequently this particular unit does not achieve the full potential economy inherent in a direct fired heater layout since it still requires the active operation of auxiliary boiler equipment.

On the expanded typical flowsheet of figure V we have blocked out an absorption plant layout based on the Dominguez installation but modified to permit of dispensing with the active operation of a boiler, although stripping steam is still used for the final cleaning-up of the lean absorption oil. This end is achieved by the direct production of steam at the base of the stripping column through the aid of a combination bottoms-water recirculation operation. As indicated on the flowsheet, a portion of the hot bottoms leaving the base of the stripper is circulated back into the bottom section of the column, whiie the various streams of water condensed and bled at the usual points of water accumulation through the system are conveyed to a central water surge tank. A recirculating water pump takes suction on this surge tank and injects a stream of stripping water into the recirculated oil stream entering the base of the stripping still. The sensible heat available in the recirculated oil stream vaporizes this water for the production of the stripping steam required for the operation of the still. A similar water circulation system is also employed for the operation of the absorption oil conditioning unit.

Conditioning Unit Essential

We are satisfied that a continuous or semi-continuous oil conditioning unit is absolutely essential to the satisfactory operation of a direct fired heater in an absorption plant, as evidenced by the hasty abandonment of similar early installations which attempted to operate

From left to right are the main distillation equipment, the direct fired heater, and the Gard oil conditioning unit of the Union Oil Co. Dominguez absorption plant.



Direct Fired Heaters...
For Absorption Plants

◆

ALCORN COMBUSTION COMPANY

has been appointed by the Union Oil Company of California, exclusive sales agents for the Gard Absorption Oil Conditioning System.

◆

ALCORN COMBUSTION COMPANY

has developed direct fired heaters for absorption plants. Both constitute important improvements in the industry and may be contracted for separately. By combining the Gard Absorption Oil Conditioning System with the Alcorn Direct Fired Heater the best results can be secured.

Our Engineers are available for conference at your convenience.

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without such oil conditioning equipment. Although the oil conditioning still for the Dominguez absorption plant is not shown on the flowsheet of figure I, it should be noted that a conventional Gard[1] steam heated unit is used in this plant. Figure VI presents a photographic view of a similar typical Gard continuous oil conditioning unit with its control board, distillation column, condenser, and condensate receiver.

Although the present Dominguez oil conditioning unit operates on a conventional steam cycle, the higher oil temperatures available with a direct fired heater operation make possible the modification of the conventional unit indicated on figure V. In this modified layout the usual feed preheater is omitted, and recirculation on hot stripper bottoms is employed for adding reboiling heat to the column while operating at atmospheric pressure.

Application of Heat

Having settled on a direct fired heater installation, the process engineer must next decide at what point in the system the fired heat should be applied, and whether or not stripping steam should continue to be used in the main distillation column. We have made a detailed analysis of four methods of applying direct fired heat to the distillation equipment, in seeking the correct answer to these two much debated questions. These four methods involve:

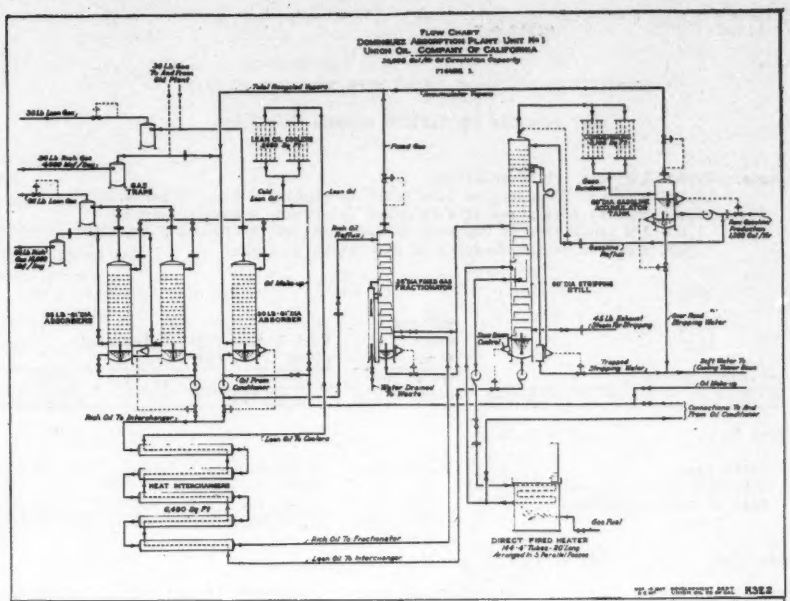
1. Using the direct fired heater as a preheater just ahead of the main stripping column, operating in conjunction with stripping steam generated by water injection at the column's base.

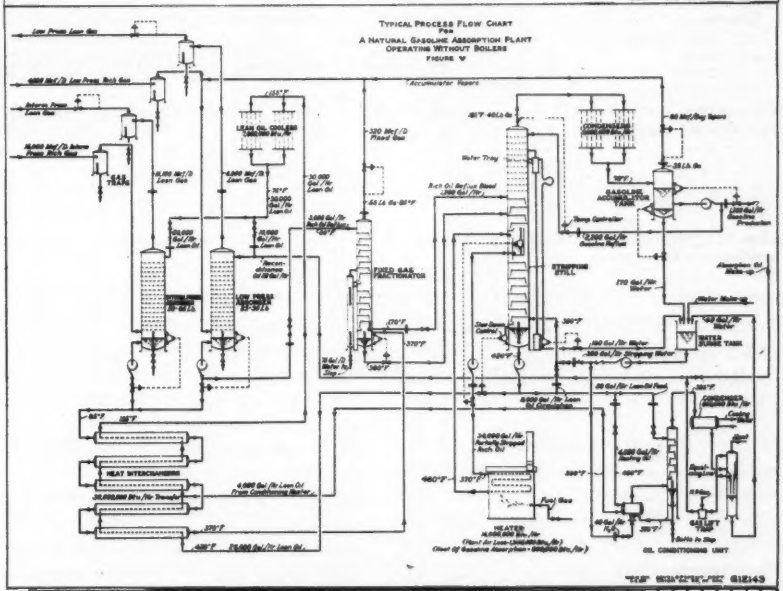
2. Operating the fired heater on a recirculated side draw-off stream taken intermediate the feed and bottom sections of the column, while injecting water at the column base.

3. Operating the fired heater on a recirculated bottoms stream with the elimination of steam stripping.

4. Operating the heater on a recirculated side draw-off stream while injecting stripping steam at the column base. (Test B-49)

Now the main distillation column must make a sharp separation between absorbed gasoline and lean absorption oil while operating under a column pressure sufficient to effect condensation of the overhead gasoline at available cooling water temperatures. This "pressure"





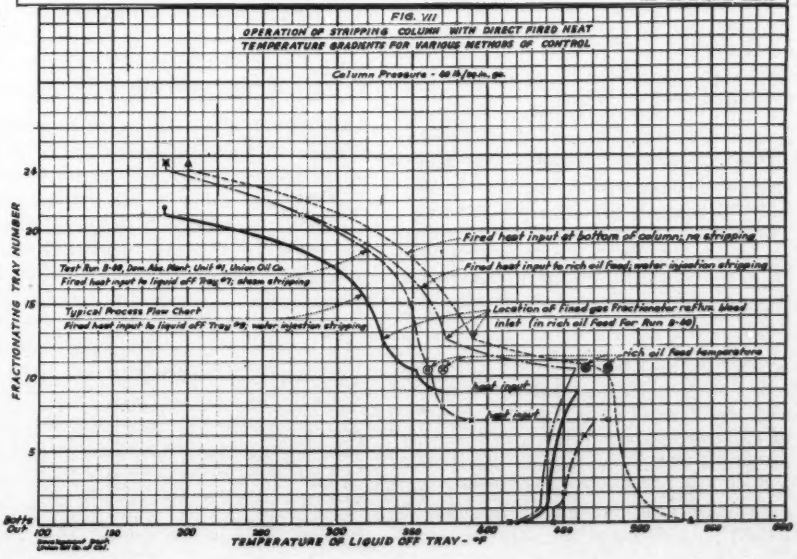


FIG. VII
OPERATION OF STRIPPING COLUMN WITH DIRECT FIRED HEAT
TEMPERATURE GRADIENTS FOR VARIOUS METHODS OF CONTROL
Column Pressure - 60 lb./sq.in. ga.
FRACTIONATING TRAY NUMBER
TEMPERATURE OF LIQUID OFF TRAY - °F
Fired heat input at bottom of column; no stripping
Fired heat input to rich oil feed; water injection stripping
Location of Fired gas Fractionator reflux bleed inlet (in rich oil Feed For Run B-49).
Test Run B-49, Dom. Abs. Plant, Unit #1, Union Oil Co.
Fired heat input to liquid off Tray #7; steam stripping
Typical Process Flow Chart
Fired heat input to liquid off Tray #8, water injection stripping
rich oil feed temperature
heat input
heat input
Bottle Out

[1] E. G. Ragatz and C. D. Gard, "Absorption Oil Conditioning Process," *Refiner and Natural Gasoline Manufacturer*, Vol. II, No. 2, February, 1932; p. 204.

TABLE # I

OPERATION OF STRIPPING COLUMN WITH DIRECT FIRED HEAT

HEAT BALANCES FOR VARIOUS METHODS OF CONTROL

Basis: 30,000 G/H lean oil circulation
16,000 Mcf/day 60 lb. gas of 1.34 G/Mcf iso-butane & heavier content
4,000 Mcf/day 30 lb. gas of 2.35 G/Mcf iso-butane & heavier content
1,300 G/H production of 50# Reid VP gasoline 89% iso-butane & heavier
90% plant overall extraction of iso-butane & heavier

Stripping Method	Optimum Operation	Test Run #B-49	Other Calculated Operations	
	Water Inj	Steam	Water Inj	None
Application of Direct Fired Heater	Tray #8 Liq	Tray #7 Liq	Feed to Col	Column Bottm
Heat In B. t. u./H				
Fired heat	14,000,000	11,300,000	19,700,000	15,400,000
Heat from stripping steam		3,000,000		
Heat of gaso absorption	900,000	900,000	900,000	900,000
Total	14,900,000	15,200,000	20,600,000	16,300,000
Heat Out B. t. u./H				
Lean oil cooler	7,800,000	8,860,000	7,800,000	7,800,000
Condenser	5,000,000	5,040,000	10,700,000	6,400,000
Oil conditioner	800,000	-	800,000	800,000
air loss	1,300,000	1,300,000	1,300,000	1,300,000
Total	14,900,000	15,200,000	20,600,000	16,300,000
Interchanged heat, B.t.u/H	32,000,000	36,100,000	31,000,000	48,700,000
Interchanger surface, sq. ft.	6,480	6,480	6,480	9,400

Union Oil Company of California
Development Department

limitation on the column's operation has a very important bearing on the relative economy of the four controls outlined above.

Table I presents a comparison of the pertinent equipment heat loads developed under the four controls in question. This table clearly shows the superiority of the side circulation control of figure V over the other three in that:

1. The side drawoff operation requires decidedly less fired heat and smaller condenser surfaces than is required by the preheated feed operation.

2. The side drawoff control with water injection requires decidedly less interchanger surface than is required by the "dry" bottoms heating operation.

3. Using the water injection operation of figure V permits of dispensing with the continuous operation of an auxiliary boiler.

A clear-cut background for the heat balance comparisons indicated on table I is presented by the stripping still temperature gradients for these controls plotted on figure VII. Focusing on the typical side recirculation gradient versus the preheated feed gradient of this figure, it will be noted that the side recirculation control maintains a slightly higher stripping section temperature while operating with a markedly lower vapor inlet temperature to the fractionating section of the column. This combination of higher stripping section and lower fractionating section temperatures accounts for the marked superiority in fired heat consumption and condensing load shown in table I. This favorable distribution of heat level is the result of the vapor-liquid heat interchange which takes place on the trays intermediate the feed and side recirculation sections of the column in the case of side recirculation control.

When the "dry," bottoms heated gradient of figure VII is compared with the preheated feed gradient, one might assume that the dry cycle would require the same high heat load on the fired heater and condensers as is required by the preheated feed cycle, since both controls operate with approximately the same vapor temperature inlet to the fractionating section of the column. It should be remembered, however, that the volume of vaporization at the feed plant in the case of the dry cycle is much lower than that of the preheated feed cycle, due to the absence of stripping steam within the column in the dry operation.

The 535°F. bottoms temperature indicated for the dry, bottoms heated control represents the operation with a typical 39°API-500°F. endpoint absorption oil. This high bottoms temperature could be lowered somewhat by using a lighter grade of absorption oil. The advantages accruing from the lowering of the stripping column's bottoms temperature, however, would be more than over balanced by the consequent greater oil losses experienced at the absorbers and the increased reflux heat required at the main column for effecting a sharp cut between the absorbed gasoline and the lean absorption oil. A comparison of the high bottoms temperature of the dry, bottoms heated cycle with the low bottoms temperature of the side recirculation cycle clearly shows why the dry cycle requires a decidedly larger installation of interchanger surface.

It should be noted that the column arrangement of figure V, using water injection at the column base, calls for a somewhat different tray arrangement than is used with the present Dominguez column, the overall tray requirements for the present and future columns being 24 and 21 trays respectively.

Spare Heater Unnecessary

To date, most process engineers have included a spare heater in their estimates for a direct fired heater installation for an absorption plant. This inclusion of a spare heater unit has put the direct fired layout in an unfavorable initial investment position when compared with a conventional steam heated plant. A year's operation of Union's Dominguez plant has clearly demonstrated that this spare heater investment penalization of the fired heater plant is unnecessary, provided the fired heater is properly designed for reasonably low radiant tube heat input rates and the absorption oil is kept in proper condition by a continuously operating oil conditioning unit.

Obviously a plant not provided with a spare fired heater must be equipped with adequate safeguards against loss of the heater tubes due to a failure of the oil circulating pumps. This operating feature has been provided for at the Dominguez unit by the installation of a differential pressure control system which automatically shuts off the fuel gas supply to the heater when the pressure drop through the heater tubes falls below a predetermined figure representing a substantial oil circulation through the heater.

While individual plant conditions and types of equipment have a marked bearing on cost comparisons, we estimate in general that the initial investment cost for a fired heater versus a conventional

steam plant will swing over in favor of the fired heater unit at a total heat load of some 10,000,000 Btu's/hour, with the comparison rapidly increasing in favor of the fired heater installation as the Btu heat load increases. In addition to this saving in initial capital outlay, the direct fired heater, of course, has a marked advantage over the conventional steam boiler in its daily operating cost.

Fixed Gas Fractionator

Although not directly dependent for its operation upon the higher heat plane available with the direct fired heater, the gas fractionator used at the Dominguez unit contains several unique features which are well worth comment in connection with a general survey of this plant's operation.

From the start it has been recognized that a fixed gas fractionator is a valuable piece of equipment in a high pressure gasoline plant. Its desirability in low pressure plants, however, has always been more or less open to question. The Dominguez installation was made for the specific purpose of developing whether or not a fixed gas fractionator could be justified in a low pressure plant.

It is an unfortunate fundamental characteristic of the absorption operation that undesirable light fractions must be taken up in the absorption oil at the absorber along with the desired heavier fractions. These light fractions must subsequently be removed from the gasoline in the form of vapors, since they cannot be condensed at the pressures and temperatures normally available at the absorption plant still. These gases are usually vented off from the gasoline accumulator and recirculated through an absorber. Now all absorbers loose some desired fractions overhead, consequently if the recirculated fixed gases carry with them desired gasoline fractions, the overhead loss of these fractions from the absorber will be increased in proportion to the amount of desired fractions recirculated along with the fixed gases. The function of a fixed gas fractionator is to reduce the quantity of desired fractions so recirculated through the main absorbers.

The amount of desired fractions recirculated through the absorbers tends to be a function of the amount of fixed gas so recirculated. If the same quality of rich gas is treated at a 30-pound absorber and a 400-pound absorber for the same desired component recovery, some 50% more fixed gases will be picked up in the absorption oil at the high pressure tower. This increased ratio of fixed gas to desired components under the high pressure operation largely accounts for the early acceptance of the fixed gas fractionator in high pressure plants.

TABLE II

OPERATION OF FIXED GAS FRACTIONATOR

PERTINENT OPERATING RATES

Run No. Date Operation		B-43 2-23-37 without F. G. Fractionator	B-49 3-24-37 with F. G. Fractionator
Fract. fixed gas	Mcf/D		321
Accum. vapors	Mcf/D	554	76
Total Recycled Vapors	Mcf/D	554	397
Rich oil reflux to fract (30 lb.)	Gal./H		2960
Ratio-R.O.reflux/fract F. G.	Gal./Mcf		222
R.O. reflux bled off tray 2	Gal./H		(approx) 1500
Ratio-Fixed gas to accumulator vapors			4.23
Fuel to heater	Mcf/D	316	352
Steam to stripper	Gal./H	318	324
Lean oil circulation	Gal./H	26,780	27,000
Ratio-Gal. stripping steam/1,000 gal. L.O. circ	Gal./M gal.	11.9	12.0
Lb. stripping steam/1,000 gal. L.O. circ	Lb./M gal.	99	100
Stripping steam carried overhead to condenser	Gal./H	144	147
Stripping steam from column at water drawoff	Gal./H	174	177
Gasoline reflux	Gal./H	2,270	1,945
Production (By Bassler meter)	Gal./H	1,118	1,148
Lean oil to 60 lb. abs. 1-A	Gal./H	11,400	11,600
Lean oil to 60 lb. abs. 1-C	Gal./H	5,280	5,100
Lean oil to 30 lb. abs. 1-C	Gal./H	10,100	10,300
Total L.O. circ		26,780	27,000
Oil circ through heater		24,600	25,400
Lean gas from 60 lb. abs. 1-A	Mcf/D	8,350	8,270
Lean gas from 60 lb. abs. 1-B	Mcf/D	3,570	3,690
Total 65 lb. lean gas	Mcf/D	11,920	11,960
60 lb. rich gas	Mcf/D	12,850	12,920
30 lb. lean gas from abs 1-C	Mcf/D	3,690	3,690
30 lb. rich gas to abs. 1-C (less recycled vapors)	Mcf/D	3,790	3,730

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Installation Justified

Our analysis of the Dominguez unit indicates that while the resultant savings are smaller for a low pressure plant, nevertheless a fixed gas fractionator can be thoroughly justified in a low pressure installation, particularly if the fractionator design is a simple one. Such simplicity has been attained in the Dominguez fractionator design through the elimination of the conventional bottoms reboiler and the use of rich oil for reflux.

In operation, the 370°F. fat absorption oil leaving the Dominguez interchanger is introduced directly into the base of the fractionating column where most of its fixed gases, along with a substantial proportion of desired gasoline fractions, are flashed off as vapors. These vapors travel upward through the fractionator trays in conventional countercurrent contact with a down-flowing stream of rich oil reflux. Reboiling control on the fractionator is maintained by bleeding some 40% of the resultant reflux liquid off the bottom tray at a temperature of 170°F., while the balance of the reflux falls into the base of the column and is there heated to a temperature of some 350°F. By raising or lowering the amount of reflux bled directly from the bottom tray to the main column, the amount of heat carried up into the fractionating column can be accurately regulated. This regulation, in turn, gives a definite temperature control on the vapors leaving the column. At Dominguez, the controls on the fixed gas fractionator are so adjusted between quantity of rich oil refluxed to the top of the column and quantity of reflux bled off the lower fractionating tray, as to produce a combination control in

TABLE III-A

OPERATION OF FIXED GAS FRACTIONATOR

FRACTIONAL ANALYSIS OF SAMPLES

Run No.	B-43				B-49				
Date	February 23, 1937				February 24, 1937				
	Actual Analysis		Adjusted Analysis						
	Accum Gaso Liq Vol %	Accum Vapors Mol %	Accum Gaso Liq Vol %	Accum Vapors Mol %	Accum Gaso Liq Vol %	Accum Vapors Mol %	Fractionator Fixed Gas Mol%	60# Discharge Gas Mol%	30# Discharge Gas Mol%
CO_2		0.20		0.20		0.20		0.20	0.10
Methane	.09	27.81	.28	27.81	.23	22.55	44.60	92.35	87.00
Ethane	.80	11.32	.80	11.32	1.34	14.76	17.68	4.12	6.77
Propane	7.56	25.70	7.56	25.70	9.76	27.60	32.66	2.86	5.33
Iso-Butane	6.75	9.24	6.75	6.47	8,91	8.67	2.13	.29	.61
N-Butane	32.24	20.07	32.24	22.84	31.58	20.55	2.42	.14	.15
Residue	52.56	5.66	52.37	5.66	48.18	5.67	.51	.04	.04
Total	100.00	100.00	100.00	100.00	100.00		100.00	100.00	100.00
		Gal./Mcf		Gal./Mcf			Gal./Mcf	Gal./Mcf	Gal/Mcf
Iso-Butane		3.000		2.100			.692	.094	.198
N-Butane		6.311		7.182			.761	.044	.047
Residue		2.058		2.058			.184	.014	.014
Total		11.369		11.340			1.637	.152	.259
Res. grav. °F	74.9	85.2			74.8	82.9			

Engler Distillations

Sample	Grav	Init	10%	20%	30%	40%	50%	60%	70%	80%	90%	Max Rec	Loss	100°F Reid VP
B-43 Raw Gaso	90.0	56	73	85	102	123	150	184	243			286	71.8	27.4 44.3
B-49 Raw Gaso	90.6	56	69	83	97	118	145	178	230			277	73.1	26.3 50.2

	Grav	Init	0.2%	0.4%	o.6%	CNGa Vapor Pressure
B-49 Lean Oil	38.9	245	264	342	419	9mm. H^2O at 100° F

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TABLE III-B

OPERATION OF FIXED GAS FRACTIONATOR

COMPARISON OF ACCUMULATOR TANK EQUILIBRIUM FACTORS

	*f values from charts for 60°F 48# abs.	TEST B-43 Accumulator at 59°F - 48 lb. Abs. Laboratory Analysis $\frac{P}{\pi}$	$\frac{Y}{X}$	"f"	Adjusted Analysis $\frac{Y}{X}$	"f"	TEST B-49 Accumulator at 60°F 48 lb. abs. Laboratory Analysis $\frac{P}{\pi}$	$\frac{Y}{X}$	"f"
Methane	0.7	100	214	2.14	70.5	.705	102	70.4	.69
Ethane	0.95	10.4	9.5	.91	9.5	.915	10.5	7.54	.72
Propane	1.0	2.23	2.64	1.18	2.64	1.18	2.25	2.22	.99
Iso-Butane	1.05	.812	1.26	1.55	0.851	1.08	.825	.905	1.10
N-Butane	1.20	.525	.553	1.05	.631	1.20	.532	.590	1.11

*f = Raoult's law correction factor in

$$\frac{Y}{X} = f\frac{P}{\pi}$$

where Raoult's law is represented by

$$\frac{Y}{X} = \frac{P}{\pi}$$

y = mol % concentration of the component in the vapor
x = mol % concentration of the component in the liquid
P = vapor pressure of the pure component at the system temperature
π = total pressure on the system - lb. abs.

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which approximately 80% of the total recirculated vapors are bled off the fractionator and 20% off the accumulator, with the fractionator overhead vapors leaving at a temperature of 85-90°F. By experience we have found that this control produces a minimum recycling loss of desirable gasoline fractions at the absorbers.

It will be noted that a water drawoff installation is provided for the Dominguez fixed gas fractionator. Although not readily apparent, it is a fact that a certain amount of water is brought into the distillation system in solution in the cold rich oil. This water flashes out of the oil at the base of the fractionator, and if no provision is made for its removal from the side of the column, its presence in the fractionator will result in unduly high overhead vapor temperatures. By providing for the withdrawal of water from the side of the column, however, a proper temperature control can be maintained on the column.

Butane Losses

In connection with the development of the proper fractionator control for the Dominguez unit, we have indicated on figure VIII the relationship existing between fractionator control and butane losses for three distinct types of controls, namely:

1. Using the special Dominguez fractionator control employing a partial bleeding of reflux off the bottom tray.

2. Using a conventional column control in which all reflux is dropped into the base of the column.

3. Operating with the fractionator cut out of the system.

These curves reveal some extremely interesting relationships regarding the Dominguez fractionator control, namely:

1. With the special bottom tray control in operation, refluxing 10% of rich oil over the top of the fractionator reduces the normal butane recycle loss by 70%.

2. Under a conventional column control dropping all the reflux into the bottom, a 10% refluxing of rich oil to the fractionator produces no reduction in recycle loss over that obtained with the fractionator cut out of the line.

3. Without the bottom tray bleed control it is necessary to increase the fat oil reflux to the fractionator from 10% to 16% of total circulation in order to attain an equivalent reduction in recycled butane losses.

A background for the control relationships indicated by the curves of figure

VIII is developed by an inspection of the fixed gas fractionator temperature gradients shown on figure IX. These temperature gradients are for run points B- 31 and 49, B-26, and B-37 of figure VIII. In runs B-49 and B-37 the overall butane losses were the same; however, some 50% more fat oil reflux had to be employed at the fractionator in the case of run B-37 in order to compensate for the higher mean temperature at which the column was operating during this test. Similarly, when the rich oil reflux was cut back to the 10.2% circulation of run B-26 without utilizing a bottom tray drawoff control, the still higher tray temperatures resulting from this operation produced losses equivalent to those attained when the fractionator was cut entirely off the line. This comparison clearly shows the desirability of so regulating the fixed gas fractionator controls as to produce an optimum combination of low tray temperatures with satisfactory application of refluxing heat to the lower section of the column.

Evaluation of Savings

Tests B-43 and B-49 on the Dominguez unit served to develop an accurate evaluation of the savings resulting from the installation of its fixed gas fractionator. Table II gives the pertinent operating rate data for these two tests. Reference to this table shows the substantial reduction in total recycled vapors and the marked reduction in recycled accumulator vapors resulting from the operation of the fixed gas fractionator, the total recycled vapors being reduced from 554 Mcf/day to 397 Mcf/day, and the recycled accumulator vapors from 554 Mcf/day to 76 Mcf/day for a 27,000 gal/hr lean oil circulation. This table also indicates the relatively low stripping steam rates employed with the higher temperatures obtainable with the direct fired heater cycle, the rates for these tests amounting to only 100 lbs./1000 gallons of oil circulated.

Table III-A presents actual and adjusted fractional analyses of the test samples associated with the operating data of table II. In checking over table III-A it will be noted that whereas the original analyses for the B-49 samples were used "as reported," the analyses of the B-43 samples were adjusted to bring them into more consistent relationship with known equilibria data. The basis for making this adjustment is indicated on table III-B.

Many factors influence the accuracy of original sample analyses, the most usual of which are deviations in accuracy of the laboratory work and secondary surges through the plant equipment

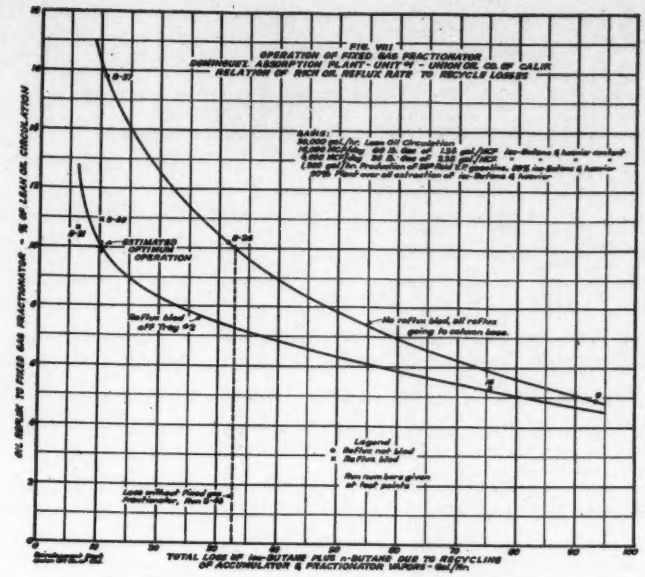
FIG. VIII
OPERATION OF FIXED GAS FRACTIONATOR
DOMINGUEZ ABSORPTION PLANT - UNIT #1 - UNION OIL CO. OF CALIF.
RELATION OF RICH OIL REFLUX RATE TO RECYCLE LOSSES
ESTIMATED OPTIMUM OPERATION
No reflux blead, all reflux going to column base.
Legend
TOTAL LOSS OF Iso-BUTANE PLUS n-BUTANE DUE TO RECYCLING OF ACCUMULATOR & FRACTIONATOR VAPORS - Gal./hr.

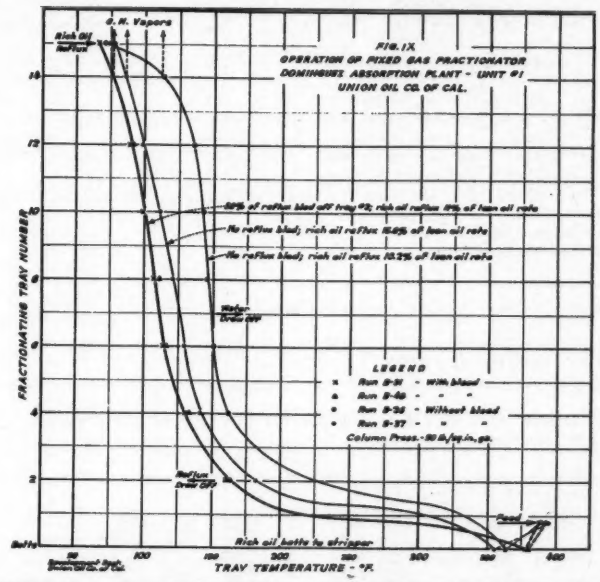
FIG. IX
OPERATION OF FIXED GAS FRACTIONATOR
DOMINGUEZ ABSORPTION PLANT - UNIT #1
UNION OIL CO. OF CAL.
G. H. Vapors
No reflux blead; rich oil reflux 15.2% of lean oil rate
LEGEND
Column Press. - 90 lb./sq.in. ga.
Rich oil bottom to stripper
TRAY TEMPERATURE - °F.

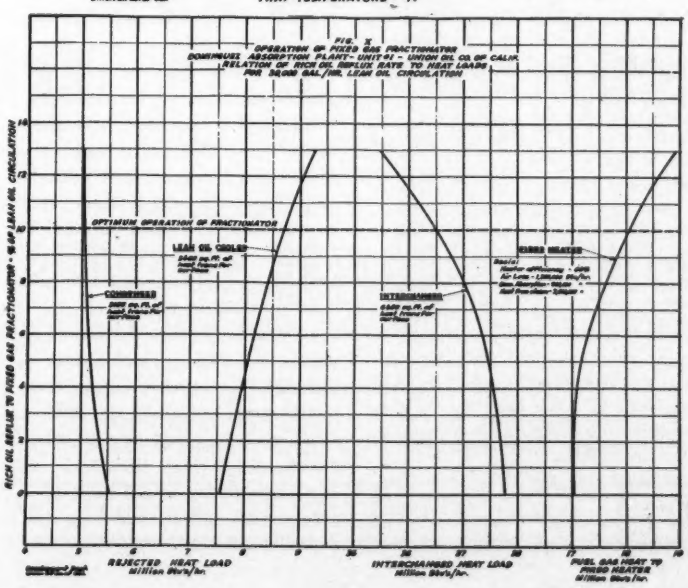
FIG. X
OPERATION OF FIXED GAS FRACTIONATOR
DOMINGUEZ ABSORPTION PLANT - UNIT #1 - UNION OIL CO. OF CALIF.
RELATION OF RICH OIL REFLUX RATE TO HEAT LOADS
FOR 30,000 GAL./HR. LEAN OIL CIRCULATION
OPTIMUM OPERATION OF FRACTIONATOR
LEAN OIL COOLER
CONDENSER
INTERCHANGER
FIRED HEATER
RICH OIL REFLUX TO FIXED GAS FRACTIONATOR - % OF LEAN OIL CIRCULATION
REJECTED HEAT LOAD
INTERCHANGED HEAT LOAD
FUEL GAS HEAT TO FIRED HEATER

TABLE IV

OPERATION OF FIXED GAS FRACTIONATOR

COMPARISON OF LOSSES DUE TO THE RECYCLING OF GASOLINE FRACTIONS

Run No. B-49 with Fixed Gas Fractionator in Operation
February 24, 1937

		Iso-Butane	N-Butane	Residue
30# lean gas content	G/H	46.9	21.9	6.9
60# lean gas content	G/H	30.4	7.2	2.2
Composite lean gas content from plant	G/H	77.3	29.1	9.1
Raw gasoline production content	G/H	101.8	361.0	549.9
Rich gas content to plant	G/H	179.1	390.1	559.0
Actual plant extraction	%	56.8	92.5	98.4
Recycled accumulator vapor content	G/H	8.9	20.4	6.4
Recycled fractionator vapor content	G/H	9.2	10.2	2.5
Content of total recycled vapors	G/H	18.1	30.6	8.9
Total absorber intake content	G/H	197.2	420.7	567.9
Actual absorber extraction	%	60.8	93.1	98.4
Actual absorber loss	%	39.2	6.9	1.6
Theoretical absorber loss-Kremser*	%	31.0	5.6	0.1
Correction factor for theoretical loss		1.26	1.23	-
Loss due to recycled vapors	G/H	7.1	2.1	-

Run No. B-43 without Fixed Gas Fractionator - Feb. 23, 1937

Recycled accumulator vapor content	G/H	48.6	166.0	47.5
Theoretical absorber loss-Kremser*	%	30.0	5.0	0.1
Corrected theoretical absorber loss	%	37.8	6.2	1.6
Loss due to recycled vapors based on corrected theoretical loss	G/H	18.4	10.3	-

Butane Savings Effected by Fractionator

Saving due to fractionator	G/H	11.3	8.2
Saving due to fractionator, % of actual plant extraction,	%	11.1	2.3

* "Kremser" losses based on average temperature of oil and gas streams leaving the absorbers

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during the period of taking the test samples. As a result of these influences, we find it advisable wherever possible to check companion vapor-liquid sample analyses against known equilibria data. In the first column of table III-B we have tabulated the "f" correction factors for Raoult's law for the individual sample components through normal butane for the conditions of pressure and temperature existing at the gasoline accumulator during these tests. It will be noted that the gasoline-vented gas "f" factors for test B-49 are in excellent agreement with the chart values, whereas some adjustment of the test B-43 data was required in order to bring these factors into similar agreement. We consider adjustments of this character to be thoroughly justified in making the type of comparison worked out for those two particular tests.

Table IV gives the build-up of our comparison of butane losses with and without the fractionator in operation. This table demonstrates the general method employed for building up the loss data plotted in figure VIII, it being remembered, however, that the data of figure VIII have been further modified to bring all points to a common basis of 30,000 gallons per hour of lean oil circulation. The data of table IV show a clean-cut saving of 11.3 gallons per hour of iso-butane and 8.2 gallons per hour of normal butane for the Dominguez operation, with the absorbers working on a 7-10% normal butane loss factor. If this normal butane loss factor had been of the order of 25%, which is not at all unusual for heavily loaded plants, the savings effected by the fixed gas fractionator would have been of the order of 20 gallons per hour for normal butane alone.

Additional Investment

Naturally one cannot attain savings of the character indicated for the Dominguez fractionator without incurring additional investment and operating costs. The additional investment cost for the Dominguez installation consists of the capital charges incident to the installation of the fractionating column with its simple pipe manifolding and certain additional cooling tower facilities, while the major additional operating costs are for additional fuel at the heater and additional water circulation at the cooling tower.

Figure X indicates the general relationship existing between the operating control carried on the fractionator as measured by per cent of rich oil refluxed, and the corresponding effect on the heat loads at the condenser, lean oil cooler, interchanger, and fired heater—with the optimum operation of 10% reflux to the fractionator being indicated by a dashed horizontal line.

An inspection of figure X shows that as the rich oil reflux rate to the fractionator is increased, the lean oil cooler and fired heater loads increase and the condenser and interchanger heat loads decrease. Table V summarizes the net effect of these changes on the various items entering the overall plant heat balance for Dominguez tests B-43 and B-49, and the flow chart layout of figure V. This tabulation indicates that a 10% rich oil reflux rate, as called for by the typical flowsheet of figure V, will require some 690,000 Btu's/hour of added heat load at the fired heater, with a corresponding increased charge in cooling tower operation for the subsequent dissipation of this added heat load to the atmosphere. These charges represent the major additional operating charge against the fixed gas fractionator. The added cooling tower investment charge required to handle this increased heat load is made up of a balance between a 15% additional cooling surface requirement and a 10% decreased condensing surface requirement.

While we have not presented comparative figures developing the actual financial worth of the Dominguez fractionator installation, we can say in general that in our opinion any plant recirculating 500 mcf/day or over of fixed gases, when operating with absorber normal-butane loss ratios of 10% or higher, will show an excellent return on the installation and operating costs for a similar fixed gas fractionator.

Summary

In summarization of this analysis of

Union's direct fired heater installation at Dominguez, we would state that:

1. A continuous or semi-continuous oil conditioning unit is absolutely essential to the satisfactory operation of a direct fired heater in absorption plant service.
2. Given a proper quality of absorption oil, no spare unit need be provided for a properly designed heater equipped with adequate safeguards against feed pump failure.
3. Stripping steam should continue to be used at the main stripping column.
4. The proper location for the fired heater is on a recirculated side stream drawn off the main column two or three trays below the feed plate.
5. The advantages of utilizing stripping steam in the main distillation column can be obtained without resorting to the continous operation of an auxiliary boiler by the injection of a stream of water into a recirculated portion of the column bottoms.
6. A direct fired heater installation becomes definitely attractive both from an initial investment standpoint and daily operating savings when the overall plant heat load exceeds 10,000,000 Btu/hour.
7. The installation of a fixed gas fractionator in a low pressure plant appears definitely justified if the plant is recirculating 500 Mcf/day or more of fixed gases while operating on a normal butane loss ratio of 10% or over at the absorbers.

In closing, the authors desire to acknowledge their indebtedness to R. E. Haylett, director of manufacturing, and E. W. Gard, development engineer, Union Oil Co. of California, for releasing the technical data of this paper for publication, and to the various members of the development and gas departments who cooperated in its preparation.

TABLE V

OPERATION OF FIXED GAS FRACTIONATOR

COMPARISON OF PLANT HEAT BALANCES
WITH AND WITHOUT FIXED GAS FRACTIONATOR

		Test B-43 Without Fixed Gas Fract.	Test B-49 With Fixed Gas Fract.	Fig. V Flow Chart With Fixed Gas Fract.
Lean oil circulation rate	Gal/Hr	26,780	27,000	30,000
Raw gasoline production rate		1,118	1,148	1,300
Interchanger heat transfer	Btu/Hr	33,600,000	32,400,000	32,000,000
Rejected Heat				
Lean oil cooler	Btu/Hr	6,750,000	7,980,000	7,600,000
Gasoline condenser	Btu/Hr	4,950,000	4,540,000	5,000,000
Oil conditioner condenser	Btu/Hr	On Unit #2	On Unit #2	800,000
Total cooling tower load	Btu/Hr	11,700,000	12,520,000	13,600,000
Air loss estimated	Btu/Hr	1,200,000	1,200,000	1,300,000
Total heat rejected from plt		12,900,000	13,720,000	14,900,000
Heat Input to Plant				
Fuel to heater	Mcf/Day	316	352	471
Fuel to Heater @ 1120 Btu/Cu.Ft.	Btu/Hr	14,750,000	16,400,000	22,000,000
Heater efficiency	%	65	62	63.5
Heat input from heater	Btu/Hr	9,600,000	10,200,000	14,000,000
Heat input from stripping steam	Btu/Hr	2,500,000	2,720,000	none
Heat input from gasoline absorption	Btu/Hr	800,000	800,000	900,000
Total heat input to plant	Btu/Hr	12,900,000	13,720,000	14,900,000

Net Heat Required by Fixed Gas Fractionator

$= (13{,}720{,}000 - \frac{27{,}000}{26{,}780} \times 12{,}900{,}000)$ Btu/Hr — 680,000 with 11% RO Reflux; 690,000 with 10% RO Reflux

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Union-Superior Well Now Deepest In Calif.

The deep test of the Superior and Union Oil Cos., K.C.L. 1, located in sec. 11, 30-26, five miles southeast of Greeley, is now below 12,050 ft., and becomes the deepest well ever to be drilled in California, and one of the deepest in the world. The California record was formerly held by General Petroleum Corp. Berry No. 1, at South Belridge, which was abandoned at a depth of 11,377 ft. The operators have given no indication that drilling will be stopped, and more records may be set before it is finished.

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New G. P. Tanker On Maiden Voyage

A. L. Weil, president of General Petroleum, and Captain Paul Muller, master of the "Mobiloil," on board the tanker during reception to ship and crew at its arrival in Los Angeles.

Visited by many of the officials of General Petroleum Corp. at Los Angeles Harbor on its maiden voyage to the Pacific Coast, the new tanker, S. S. "Mobiloil" took a load of gasoline to the Atlantic seaboard. The tanker, and its sister ship, the "Mobiloil", are the largest of a fleet of 45 tankers in the service of Socony-Vacuum Oil Co.

Each vessel is 501 ft. in length, with breadth of 68 ft. and depth of 37 ft., and is powered by one 4000-horsepower steam turbine.

Among General Petroleum officials and executives attending the reception aboard the "Mobiloil" were: A. L. Weil, president; R. A. Sperry, vice president; A. H. DeFriest, vice president and general sales manager; A. O. Woll, a director and manager of the marine department; Neil H. Marsh, manager export division; M. D. Leh, assistant general sales manager; A. D. Bennison, manager black oil sales; W. B. Curtis, sales promotion manager; Lloyd Moore, of the marine department; W. C. Lynch, manager personnel department; W. A. Appleford, manager, legal department.

A. H. Bell, of Continental Oil Co., Los Angeles, has been appointed chairman of the California District Sub-committee on Standard Rigs and Derricks, A.P.I. He succeeds R. R. Robison, resigned.

W. C. Whaley, of Barnsdall Oil Co., Los Angeles, has been appointed chairman of the California District Sub-committee on Standardization of Rotary Drilling Equipment, succeeding F. F. Hill, resigned.

E. K. Parks, of Standard Oil Co. of California, Los Angeles, has been appointed chairman of the California District Sub-committee on Production Practice, succeeding W. E. Gilbert, of Shell Oil Co., Los Angeles. Mr. Gilbert has been appointed national chairman of the Division of Production Topical Committee on Production Practice, succeeding B. H. Robinson, resigned.

William C. Brooks, recently appointed district purchasing agent for Standard Oil Co. in Los Angeles, has been with the company for 20 years, his various occupations with the company including: display man for the sales department; roustabout and driller; assistant buyer and buyer. During the course of his employment, he has been in all of the producing fields of California and in the San Francisco and Seattle purchasing offices.

Mr. Brooks was educated in the schools of Oakland, and at the University of California. He has two children, a son of 16, and a daughter of seven.

During his employment in the fields, Mr. Brooks had one experience that not many would wish to share. He fell from the top of a 90-ft. derrick, and spent 11 months in recuperating from the fall.

Emil Kluth has been made chairman of the management committee of Pacific Western Oil Corp., the other members of the committee being H. H. Macomber, D. T. Staples and W. G. Gibson. The management committee was found necessary after the resignation of H. P. Grimm as president of the company, and the election of W. G. Skelly in his place. In Mr. Skelly's inability to be present in California, a local management was needed.

In the last issue of California Oil World, Dr. Gerard Henny was mentioned in connection with his recent association with various Edington companies, as having been instrumental in the discovery of Signal Hill. This latter statement was in error, and Dr. Henny has corrected the California Oil World, informing the publication that he did not arrive in California until late in 1922, by which time the townlot drilling boom was well under way. In justice to Dr. Henny, he did not furnish the item in question, so there can be no thought of his trying to take credit where credit is not due.

C. R. Dale, of the Dale Service Corp., has returned from a trip through the producing areas of Pennsylvania, the Mid-Continent and the Gulf Coast, where he was engaged, with the Schlumberger Well Surveying Corp., in starting the Gale photoelectric oil well water locating process in those fields. Schlumberger has acquired a license from Dale for all fields outside of California.

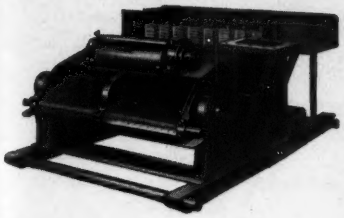
The Axelson Manufacturing Co. will hold its annual picnic at the Montebello Stadium on Saturday, May 22.

"Micky" McGuire, one of California's "old-timers" is now drilling for Kern Trinidad Oilfields, Ltd., a subsidiary of the St. Helens Co.

Clifford Hancock, director of gasoline sales for Caminol, has returned from a trip through the east and south. Mrs. Hancock accompanied him.

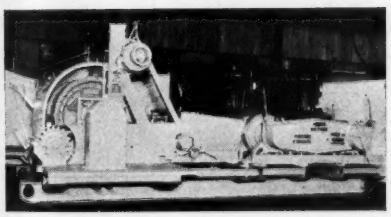
Paul Barden, the first president of the California Natural Gasoline Association, and now connected with the Sun Oil Co. in Philadelphia, was a recent visitor to Los Angeles.

Vernon Tool Announces Improved Mud Screen



Vernon Tool Co., Ltd., announces a new and improved McNeely vibrating mud screen, known as Model E, which is said to more than meet the needs of the oil industry for a dependable supply of clean, plastic drilling fluid at lowest operating and maintenance costs. Features of the McNeely vibrating mud screen include super-strength for rough service; completely unitized design for easy handling in the field, and a curved screen surface (exclusive) which increases capacity and lengthens screen life. According to the manufacturer, the new screen has an average capacity of 650 gallons of drilling fluid per minute—equal to the output of the largest mud pumps. Vibrating frame and screen cloth are divided into two sections—thus only one-half the cloth need be replaced at one time. Each half is independently tensioned and new cloth is easily installed and stretched taut.

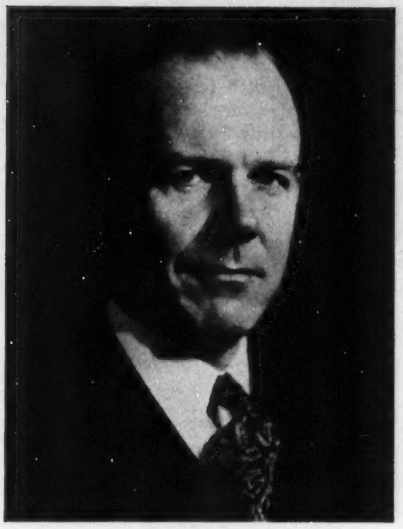
H. & B. Sales Now Represents Wilson Mfg.



H & B. Sales Co. of Long Beach has been made California representative for Wilson Manufacturing Co., manufacturers of power driven rotary drilling rigs and portable production hoists.

The photograph shows the Wilson Atlas No. 3 model power driven rig, and is one of four sizes, capable of drilling from 2500 to 10,000 ft. Power for the largest size usually consists of two 300 or 400 horse power engines, but it can utilize as much as 1000 horsepower. All rigs can be segregated into small loads and can be rigged up in one day. They use two mud pumps, either or both of which are driven from a power-takeoff arrangement.

McFarland Heads Sales Of Lycoming Gas Engines



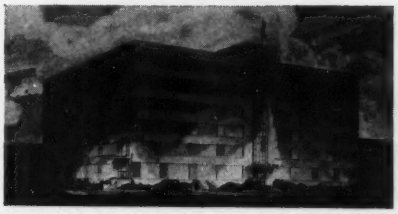
J. T. McFarland

E. D. Herrick, president of the Lycoming Manufacturing Co., Williamsport, Pa., has announced the appointment of J. T. McFarland as sales manager of the natural gas engine division of the company.

Mr. McFarland has been associated with the Worthington Pump & Machinery Corp. in various capacities for the past 18 years.

Mr. McFarland will be in charge of sales for Lycoming's gas-engine generating units and gas engines for general power purposes, with headquarters at Williamsport, Pa. These units and engines were introduced recently.

G. E. To Erect New L. A. Headquarters



A new $700,000 General Electric building at Los Angeles, designed to contain six stories and basement, three stories of which are planned to be completed for occupancy by September, will be built on Vignes St. between Banning and Turner, near the Santa Fe Station. The design and construction of the building will be under the supervision of the General Electric Realty Corp.

Martin-Decker Announces New Slush Pump Gauge

Martin-Decker has announced a new slush pump gauge that will fill a long felt need in the industry. The selection of a mud pump gauge has heretofore offered a serious problem. Its range should be high enough to cover those infrequent peaks encountered in drilling, such as cementing, breaking circulation, etc., and yet the pressure gradations should be sufficiently spaced to allow accurate reading of the ordinary low pump pressures encountered in every day drilling.

Martin-Decker has combined both of these features in one unit. Through an ingenious arrangement in the pressure element, the first 1500 pounds pressure is spread over 240 degrees of dial circumference, allowing easy and accurate vernier readings on all low pressure work. The last 1500 pounds are condensed on only 60 degrees of dial circumference, or one-fourth the spread of the first 1500 pounds, and thus permit reading of peak pressures up to 3000 pounds with complete safety.

Bill Lane, vice-president of The Lane-Wells Co., and Bill Thorn offer proof of their fishing skill with this picture of 20 beauties taken from Lake Arrowhead on the opening day, May 1. This catch, photographed at nine o'clock in the morning, was one of the first "limits" recorded for the day.

Business and Professional Directory

THE HANCOCK OIL COMPANY of CALIFORNIA

PRODUCERS - REFINERS MARKETERS

J. R. PEMBERTON
Oil Umpire
1110 Security Title Insurance Bldg.
Los Angeles, Calif.
TRinity 9705

AUDITS - TAXES - SYSTEMS

GEO. J. COLE
Certified Public Accountant
408 South Spring Street (Room 1007)
TRinity 4055

THE PETROL CORPORATION
Producers and Refiners
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Kerosene - Fuel Oils - Diesel Oil - Asphalts
Road Oils - Lubricating Oils
Distillates
4020 Bandini Blvd. - Los Angeles, Cal.

Oil Land and Production
K. C. WALLACE
Specialist
Kern County Petroleum Development
430 South Broadway
TUcker 3617

CORE ANALYSIS LABORATORY
(Incorporated)
Specializing in the physical determination of porosity, permeability, oil and water saturation of core samples.
P. O. Box 461 Ventura, Calif.
Telephone Ventura 6355

BOLSA CHICA OIL CORP'N
Producers of Petroleum
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NOTARY PUBLIC
SEE ME to have your leases and other papers validated or copied. Information on Oil Leases. Prices Reasonable.
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Geologist and Engineer
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Proven and prospective leases, fee lands and royalties bought and sold. Owners mail information to Lon V. Smith, 542 S. Lorraine Blvd., Los Angeles, California. 6-5f

FOR SALE

PRODUCING OIL WELL
on Signal Hill
Bay Oil Well No. 1 Near Twenty-First and Junipero
Get information from & Submit bids to
Chas. G. Kibbe, Jr.
3073 Cherry Avenue, Telephone 465-81
Long Beach, California. 5-20b

POSITION WANTED

Young woman with A. B. in oil geology seeks desirable connection with independent oil company. Has had ten years' experience with major companies in research, library, scouting and secretarial work. Tel.: VAndike 7087, Los Angeles. 5-20b

FOR SALE

1 Type "R" Remodeled Okell Drilling Rig in three Units including power, complete with 40' Kelly and all tools.....$5000.00
1 No. 45 Armstrong Steel Frame Drill Rig on Rubber Tires, with Mast, completely overhauled $2000.00
1 No. 50 Armstrong Steel Frame Drill Rig on Rubber, with Mast and Lines, will recondition $2500.00
1 Model "C" Fort Worth Spudder with Mast and Lines, mounted on rubber. Fordson Tractor for Power. Will be in this week. Price on request.
1 5x12 Gardner Mud Pump, rebuilt for Power Drive $900.00
1 Okell Mud Pump with Leroi Engine, built into one unit on Skids .....$ 550.00
Several Gasoline Engines complete rebuilt.
Standard Cable Tool Drilling Tools, all sizes.
Drilling Rigs and Tool for sale or rent.
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Water surveying service. David Romey, Phone Wilmington 1414, 507 Broad Ave., Wilmington, Calif. tf

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1 inch dia., 6x19, plow steel, hemp center, 100,000 feet, lengths are 1500 ft., 1600 ft., 2300 ft., 2500 ft. each reel.
1⅛ inch dia., 6x19, plow steel, hemp center, 50,000 ft., lengths run 1250 ft., 1050 ft., 900 ft. each reel.
Sell entire lot or single reels, all cables brand new, never used, American Mfg., very low prices.
Terrence P. Wynn
55 West 42nd Street - New York City, New York

MAPS
Large map of Los Angeles Basin oil fields and map showing all California oil fields. Price $15.00 each on paper and $20 each on cloth. Individual state oil and gas maps of Mid-Continent and Rocky Mountain regions. Maps show geological cross sections at base. These maps indicate wells drilling, wells producing and abandoned, with depths.
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Reconditioned or new heat exchangers, stills, fractionators, absorbers, condensers, at cut prices. Plants designed any size for any use. W. F. Pyne, 909 S. Ardmore Ave., Los Angeles. DRexel 1412. tf

SCOUT REPORTS

NEW MEXICO LEASEHOLDERS: For reliable information on New Mexico developments take my weekly scout report. W. S. Patterson, Santa Fe, N. M.